

1 IN THE UNITED STATES COURT OF FEDERAL CLAIMS

2

3 IN RE: DOWNSTREAM ADDICKS AND) Case No.

4 BARKER (TEXAS) FLOOD-CONTROL) 17-9002L

5 RESERVOIRS.)

6 _____)

7

8

9 Courtroom 8B

10 BOB CASEY UNITED STATES COURTHOUSE

11 515 Rusk Street

12 Houston, Texas 77002

13 Monday, October 28, 2024

14 10:00 a.m.

15

16

17 Trial Volume 2

18

19

20 BEFORE: THE HONORABLE LOREN A. SMITH

21

22

23

24 GARY SCHNEIDER, RMR, CRR, Court Reporter

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25

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19 REPORTER'S NOTES:

20 QUOTATION MARKS ARE USED FOR CLARITY AND DO NOT

21 NECESSARILY REFLECT A DIRECT QUOTE

22

23 PROPER NAMES ARE PHONETICALLY SPELLED UNLESS

24 STATED ON THE RECORD

25

1 P R O C E E D I N G S

2 - - - - -

3 (Proceeding called to order, 10:19 a.m.)

4 THE COURT: Good morning. I apologize for
5 the delay, but we're getting better. Fifteen minutes.
6 Hopefully tomorrow we may be right on time.

7 So where -- any housekeeping matters before
8 we begin? Do you have any?

9 MS. DUNCAN: We just have a few.

10 THE COURT: Okay.

11 MS. DUNCAN: Your Honor, our opening
12 statement slides from Friday, we've marked those DX 1
13 and we'd like to offer those as a demonstrative.

14 THE COURT: Okay. Any objection?

15 MR. NOLEN: No, Your Honor.

16 THE COURT: Okay. They're admitted.

17 (Admitted Exhibit No. DX 1.)

18 MS. DUNCAN: And we'll provide a copy to the
19 court perhaps by the end of the day.

20 THE COURT: Okay. Thank you.

21 MS. DUNCAN: And then we do have one update
22 for you on the site visit. We can do that now or we
23 can do that later.

24 THE COURT: Yes. Why don't we do that now.

25 MS. DUTTON-BYNUM: Good morning, Your Honor.

1 THE COURT: Good morning.

2 MS. DUTTON-BYNUM: So I knew you inquired on
3 Friday about transportation from downtown to the
4 project office.

5 THE COURT: Yes.

6 MS. DUTTON-BYNUM: Does not seem to be a
7 feasible option with the corps vehicle coming down
8 here.

9 THE COURT: Yeah.

10 MS. DUTTON-BYNUM: But we spoke with the
11 plaintiffs' counsel and we are proposing that a member
12 of our support team, Mr. Jackson, to transport you and
13 your law clerk from downtown to the project office
14 where we will do the site visit as we proposed in our
15 itinerary.

16 THE COURT: Okay.

17 MS. DUTTON-BYNUM: And then Mr. Jackson can
18 take you and your law clerk back down to downtown along
19 the proposed route.

20 THE COURT: Okay. That sounds fine with me.
21 Any problem?

22 MR. NOLEN: No, sir.

23 THE COURT: Okay. Good. We'll then plan on
24 starting out from here at 10:00 o'clock.
25 Mr. Jackson -- we will have parked here, and then we'll

1 take the -- Mr. Jackson to and from the site.

2 MS. DUTTON-BYNUM: Okay. That sounds good,
3 Your Honor.

4 THE COURT: Do you have an approximate time
5 estimate of the whole thing? We'll be back by 2:00 or
6 3:00 or...

7 MS. DUTTON-BYNUM: I believe so, Your Honor.
8 I think our timeline kind of has us conclude the site
9 visit around 2:00, 2:00 P.M. It just kind of goes off
10 of conversations and things that the court has
11 questions about during the site visit. But early
12 afternoon is what we envision.

13 THE COURT: Okay. Good. I didn't want to
14 cut it short in any way. Obviously I want to know the
15 parameters of the time. But the important thing is I'm
16 here for is obviously witnesses and also to see the
17 site so I have a better understanding.

18 MS. DUTTON-BYNUM: Okay.

19 THE COURT: So that's fine.

20 MS. DUTTON-BYNUM: Okay. Just to clarify,
21 Your Honor, you said you would want to be picked up at
22 10:00 A.M. here at the courthouse?

23 THE COURT: Yeah, 10:00 A.M. I guess here.
24 10:00 A.M. would be the -- and that would get us to the
25 site -- how long a drive is it?

1 MS. DUNCAN: If there's not traffic,
2 approximately 20 to 25 minutes.

3 THE COURT: Okay. That's good. So we'd be
4 able to start there around 10:30, presumably.

5 MS. DUTTON-BYNUM: Okay.

6 MR. NOLEN: Your Honor, I suspect that he can
7 pick you up at your hotel.

8 THE COURT: What?

9 MR. NOLEN: I suspect he can pick you up at
10 your hotel and drop you back off at your hotel as
11 opposed to having to come to the courthouse.

12 THE COURT: Oh, okay. Absolutely.

13 MR. NOLEN: I think so. I'm volunteering him
14 here, but I think he can do that.

15 MS. DUNCAN: Yes.

16 THE COURT: Yeah, I think that makes actually
17 a lot more sense than going back and forth. I was
18 thinking in terms of having been here for more stuff
19 but, yeah, I think that would be ideal at the Whitehall
20 Hotel. It isn't very far from here, 20 minutes,
21 something like that. So, okay. That's good. We have
22 that organized and thank you both for that.

23 And I guess our first witness.

24 MR. McGEHEE: Yes, sir. Our witness is --

25 THE COURT: Returning witness.

1 MR. McGEHEE: Mr. Matt Bardol. And we passed
2 him and it's the government's turn to cross him.

3 THE COURT: Okay. That's where we left off.

4 Mr. Bardol, if you'll come back. Of course
5 still under oath. And we'll let you get seated.

6 This screen is off. And so I wonder if -- I
7 don't know if it --

8 MS. DUNCAN: We do want to make sure that you
9 are seeing the exhibits that are displayed, Your Honor.
10 Are you able to see?

11 THE COURT: No. The screen is black. I'm
12 not sure which of these controls turns on the screen.

13 MS. DUNCAN: If it happens with any of the
14 exhibits, we can arrange to have one brought up to you.

15 THE COURT: According to the little note
16 here, this is the jury screen, so I can look at the
17 jury but see a bunch of chairs. Well, one individual
18 in the chair.

19 MS. DUNCAN: May I proceed?

20 THE COURT: Yes, you may proceed.

21 MATTHEW BARDOL
22 was called as a witness and, having been previously
23 first duly sworn, was examined and testified as
24 follows:

25

1 CROSS-EXAMINATION

2 BY MS. DUNCAN:

3 Q. Good morning, Mr. Bardol. How are you?

4 A. Doing fine. Good morning.

5 Q. Good.

6 You talked to us on Friday about your expert
7 report at PX 14.

8 MS. DUNCAN: Why don't we put that up on the
9 screen.

10 BY MS. DUNCAN:

11 Q. And, Mr. Bardol, same for you. We've got
12 paper copies of any of these exhibits. I think we can
13 work today mostly off the screen. But if you would
14 like a paper copy, let us know.

15 A. Okay. Thank you.

16 THE COURT: Is there some significance to the
17 phone number there on the screen?

18 MS. DUNCAN: Your Honor, I believe that that
19 is the Zoom call, the video teleconference call.

20 THE COURT: Oh, that's from -- yeah, our
21 office. We were having -- Tanmay, is it working now?

22 THE CLERK: It is now.

23 THE COURT: Okay. It's working now. Good.

24 BY MS. DUNCAN:

25 Q. Okay. So why don't we turn to PDF page 11 of

1 your report, that's Section 1.4.

2 Okay. Mr. Bardol, I would like to ask you a
3 couple questions about Section 1.4 of your report. In
4 the second sentence, you note that "We reviewed the
5 following data and documents in preparation for this
6 report, and these data and documents serve as the basis
7 of our opinions."

8 I read that correctly, didn't I?

9 A. You did, yes.

10 Q. Okay. And then below that, toward the second
11 bottom half of the page, you have a list of various
12 items, correct?

13 A. Yes, correct.

14 Q. And it continues on to the next two pages,
15 right?

16 A. That is correct, yes.

17 Q. Okay. If we turn to PDF page 12, at the very
18 bottom, you note -- you list some witness testimony
19 that you relied on from the United States Army Corps of
20 Engineers, correct?

21 A. That is correct, yes.

22 Q. Okay. And one of the individuals that you
23 list is Mr. Robert Thomas, correct?

24 A. That is correct, yes.

25 Q. And throughout your report, you cite to

1 sections of Mr. Thomas' testimony?

2 A. I did in sections, yes.

3 Q. Okay. And you rely on his testimony in the
4 factual recitation portion of your report?

5 A. I do rely on his deposition, yes.

6 Q. Okay. I don't believe that you quote any
7 other individuals from the corps in your report; is
8 that right?

9 A. I don't quote them, no.

10 Q. Okay. And you -- I understand that you cite
11 Mr. Thomas' quotes in your report because he's
12 knowledgeable about matters regarding the Addicks and
13 Barker dams and reservoir project, right?

14 A. In part, yes. That's why I quoted him.

15 Q. You said "in part," what do you mean by that?

16 A. Just with his involvement, knowledge of it.
17 But, you know, that's why I quote him.

18 Q. Okay. And you know that he's the chief of
19 the engineering and construction division of the
20 Galveston District?

21 A. I don't recall his exact title, but, yes,
22 that does ring a bell, yes.

23 Q. Okay. And he's been with the corps for
24 nearly 20 years, hasn't he?

25 A. That's my understanding. I don't know the

1 exact years, but I know he's been with them for a
2 while.

3 Q. Well, that information is in his depositions,
4 correct?

5 A. It is. I just don't recall off my head right
6 now.

7 Q. Okay. And you know that he oversees all
8 aspects of dam safety for the Addicks and Barker
9 project, right?

10 A. That is my understanding.

11 Q. He is the dam safety officer for the Corps of
12 Engineers, right?

13 A. That is my understanding.

14 Q. Okay. And he was even an approver of the
15 Emergency Action Plan that was in place in 2014, right?

16 A. I don't recall that specific fact off the top
17 of my head right now.

18 Q. Okay. You know that he was out at the dams
19 during the Harvey event?

20 A. I believe he was, yes.

21 Q. Okay. And you know that he was part of the
22 decision making to make releases during the storm?

23 A. I believe he was one of them, yes.

24 Q. Now, there's only one other Corps of
25 Engineers employee that is listed on PDF page 12 that's

1 page 1-11 of your report and that's Mr. Michael
2 Kauffman, correct?

3 A. Yes, I see that. Yes.

4 Q. Okay. And you don't list Mr. Richard Long in
5 this list, do you?

6 A. I don't believe I do, no.

7 Q. You don't list Colonel Lars Zetterstrom in
8 this list, do you?

9 A. Not in this list, no.

10 Q. And you have another section of your report
11 called Section 10 where you list various references,
12 right?

13 A. That is correct, yes.

14 Q. And you also don't list Colonel Lars
15 Zetterstrom's testimony in that list either, do you?

16 A. I don't believe I do.

17 Q. Okay. And you also don't list in either
18 section of your report testimony of Mr. Maglio,
19 correct?

20 A. I don't recall if I do. I don't think so.

21 Q. Okay. Now, on Friday you mentioned that you
22 have written Emergency Action Plans before.

23 Do you recall that?

24 A. Yes, I do.

25 Q. Okay. And an Emergency Action Plan outlines

1 plans for how to respond during emergencies at a
2 particular project; is that right?

3 A. That is correct, yes.

4 Q. And an Emergency Action Plan plans for all
5 types of emergencies, right?

6 A. There is a suite of emergencies that they do
7 cover, yes.

8 Q. It plans for, for example, natural disasters
9 at a particular project?

10 A. That is one, yes.

11 Q. Okay. That could include floods, right?

12 A. Correct, yes.

13 Q. It could include something like fires, right?

14 A. That's correct. Fires, earthquakes, other
15 natural disasters, yes.

16 Q. It might also include other sorts of national
17 security emergencies; is that right?

18 A. Correct, yeah, terrorist attacks, things like
19 that, yes.

20 Q. Okay. And so what's contained in a plan
21 depends on the specifics of the project at issue; is
22 that right?

23 A. It does. It is specific for those specific
24 projects and location, yes.

25 Q. Okay. And one reason that Emergency Action

1 Plans are put in writing is so that as new individuals
2 come in to operate a project, they know what to do
3 during an emergency; is that right?

4 A. Yes, it's written down so that way it's clear
5 for everybody that's coming into it, it's documented.
6 Also in case it has to be amended, you know, then
7 there's a formal process for modifying that Emergency
8 Action Plan because they are updated periodically.

9 Q. Okay. And project operators are supposed to
10 follow their Emergency Action Plans, correct?

11 A. Yes, correct.

12 Q. You're aware that federal law requires
13 Emergency Action Plans for numerous types of federal
14 projects?

15 A. Yes, they are required.

16 Q. And the corps requires Emergency Action Plans
17 for its projects, right?

18 A. That is correct, yes.

19 Q. And, in fact, the corps has various standards
20 for how its Emergency Action Plans are prepared,
21 correct?

22 A. There are written procedures of how they're
23 prepared, correct.

24 Q. And there's an approval process, correct?

25 A. That is correct, yes.

1 Q. An important component of an Emergency Action
2 Plan is defining the emergency conditions, correct?

3 A. That is one element, defining it, and then
4 also the preparation for them, yes.

5 Q. Okay. And the definitions for an emergency
6 condition at a -- excuse me, the definitions for what
7 constitutes an emergency is going to differ across
8 Emergency Action Plans, right?

9 A. Depending on the site and then also observed
10 observations during whatever event that's going on.

11 Q. And so how an emergency is defined will
12 differ among different Emergency Action Plans, correct?

13 A. They can, yes. They would be site-specific.

14 Q. Okay. Now, another important component is
15 defining the actions that need to be taken in response
16 to the emergency conditions, right?

17 A. It does define actions to be taken, yes.

18 Q. And those actions to be taken will also
19 differ across Emergency Action Plans, right?

20 A. They are tailored for the site.

21 Q. Okay. And finally another important
22 component is defining how the Emergency Action Plan
23 goes into effect, right?

24 A. It does define how it goes into effect and
25 who declares the emergency and when it actually becomes

1 implemented, yes.

2 Q. And how an Emergency Action Plan goes into
3 effect will differ among Emergency Action Plans, right?

4 A. The Emergency Action Plan would define how it
5 goes into effect, yes.

6 Q. Mr. Bardol, the opinions -- excuse me, your
7 opinions for this case were developed after the Harvey
8 event, right?

9 A. They were, yes.

10 Q. Okay. And they were based on information
11 that was known to you after -- excuse me, they were
12 based on information that was known after the Harvey
13 event as well?

14 A. Yes, I relied on that information that I was
15 provided after the event, yes.

16 Q. And an example of that is when you prepared
17 your report, you knew when the rain stopped at the
18 reservoirs during the Harvey event, right?

19 A. Correct. I looked at the hydrologic studies.
20 I looked at -- as far as the reports afterwards of when
21 the storm was coming in, when the rainfall started and
22 stopped and the reports they would have had.

23 Q. Okay. And when you prepared your report, you
24 knew the total amount of rain that fell during the
25 storm over the Addicks and Barker watersheds, correct?

1 A. Yes, I had the information of when it
2 stopped, the total amount, and then also the
3 hydrologic, you know, the rainfall forecast that was
4 predicting it, yes.

5 Q. And when you prepared your report, you knew
6 the amount of flow that actually flanked around the
7 north side of Addicks Reservoir, right up here?

8 A. Yes, based on testimony but then also
9 cross-checked with the water surface elevation of what
10 that flow would have been at a certain elevation.

11 Q. And when you prepared your report, you know
12 at that time that the dams did not fail during the
13 Harvey event, correct?

14 A. Correct, yes.

15 Q. Now, you were not stationed at the Addicks
16 and Barker Reservoirs during the event, were you?

17 A. During the event, no, I was not.

18 Q. And you've never been stationed at the
19 Addicks and Barker Reservoirs, right?

20 A. No, I have not.

21 Q. You have never worked at the Addicks and
22 Barker Reservoirs?

23 A. I have not worked there, no.

24 Q. You were not involved in emergency response
25 during the Harvey event?

1 A. I was not part of that, no.

2 Q. And not just at Addicks and Barker, but you
3 weren't involved in the emergency response during the
4 Hurricane Harvey event at all, right?

5 A. No, I was not.

6 Q. And you certainly weren't present during the
7 Harvey event to determine at that time if the EAP was
8 being implemented, were you?

9 A. No, I was not there.

10 Q. If we look at what plaintiffs have marked as
11 a demonstrative, I believe, 405.

12 A. Yes.

13 Q. You can see green behind these reservoirs; is
14 that right?

15 A. Yes. Actually, this -- this one is blocking
16 the Barker, the lower one.

17 MS. DUNCAN: Your Honor, may I have a moment
18 to reconfigure here?

19 THE COURT: Yes.

20 BY MS. DUNCAN:

21 Q. Mr. Bardol, can you see the map now?

22 A. I can, yes, thank you.

23 Q. Excellent.

24 A. Yeah.

25 Q. Okay.

1 A. I can see it.

2 Q. So, Mr. Bardol, Addicks and Barker -- this --
3 in this picture, this map of Addicks and Barker --

4 A. Yes.

5 Q. -- the area within the reservoirs is green,
6 right?

7 A. It is, yes.

8 Q. And that's because these are dry dams, right?

9 A. They are normally dry and then would fill up
10 after storm events, yes.

11 Q. Okay. And at the beginning of the Harvey
12 event on August 25th, these reservoirs were empty,
13 correct?

14 A. That's my understanding, yes.

15 Q. Okay.

16 THE COURT: Is there any difference -- I
17 wasn't sure of the difference between the areas marked
18 in green and the areas marked in blue on the thick
19 line.

20 MS. DUNCAN: Yes, I will happily ask a few
21 questions to that effect, Your Honor.

22 BY MS. DUNCAN:

23 Q. Mr. Bardol, you know that the area marked in
24 green is sort of the primary part of the dam; is that
25 right?

1 A. That's part of the dam, yes, it's the primary
2 part, the embankment.

3 Q. And then the areas marked in blue here are
4 what is labeled here as "auxiliary spillway"; is that
5 right?

6 A. That is correct, yes.

7 Q. And these areas are a little bit lower than
8 the green portion of the dam, right?

9 A. Varying elevations, yeah, correct. They do
10 start to slope down so that way it meets natural grade
11 at the north.

12 Q. Right.

13 So there is an -- the area in green is sort
14 of a higher elevation, and starting at the blue it
15 then, let's see, it sort of then just starts lowering
16 down all the way down to the end of the ground, right?

17 A. There's a couple different elevations, but
18 they are lower. That's where the auxiliary spillway
19 is, so that's where it's safe for the water to flow
20 over the embankment, yes.

21 Q. Okay. Now, on Friday, you suggested that
22 these are never called emergency spillways these days;
23 is that right?

24 A. That is correct, yes.

25 Q. Okay. Let's go to JX 2. Let's go to

1 page 2-1. We're going to put it up here on the screen.

2 Now, you testified about the Water Control
3 Manual on Friday, right?

4 A. I did, yes.

5 Q. It was the operative control manual in place
6 at the time of the Harvey event, right?

7 A. Yes, it was.

8 Q. So let's go to page 2-1 of this report.
9 Let's zoom in on Addicks Dam paragraph. I want to read
10 the second-to-last sentence to you. It notes "The
11 spillway consists of the conduit outlet works in the
12 South Mayde Creek channel section with emergency
13 spillway around and over the ends of the dam."

14 I read that correctly, didn't I?

15 A. You did, yes.

16 Q. When it talks about emergency spillway, what
17 it's talking about is water rising so high in the
18 reservoirs that it backs up and flows -- can flow
19 around the ends of the emergency spillway, correct?

20 A. I mean, a little bit of a clarification on
21 that. Historically these type of auxiliary spillways
22 were called emergency but there's been several
23 documents, one was just through FEMA, I think it was in
24 2013, for designing for and accommodating inflow design
25 floods. It specifically talks about emergency

1 spillways, what they used to be called that way, but it
2 specifically says that they should not be called
3 emergency and be auxiliary if they're designed for a
4 specific design flood because that implies there's an
5 emergency that there might be a failure, so it
6 specifically said all documents should go back and use
7 the term "auxiliary."

8 So I think there's some documents that
9 historically use kind of the old terminology of an
10 emergency spillway, but the practice -- engineering
11 practice is to get away from calling spillways that are
12 designed for a specific design flood to be called
13 emergency because they're going to be -- they safely
14 can pass those high-flow events.

15 Q. And so it's your position that at the time of
16 Harvey, these emergency or auxiliary spillways could
17 safely pass the spillway design flood. Is that your
18 position?

19 A. Yes, so they were designed I think it was in
20 the 1980s and then follow on that when there was the
21 improvements. That where -- it was my understanding
22 that from the information that I looked at they used
23 roller-compacted concrete to be able to pass up to that
24 spillway design flood. That was also presented on the
25 Water Control Manual or actually the Emergency Action

1 Plan.

2 Q. And so I just want to be extra clear.

3 The spillway design flood that you're talking
4 about is a theoretical storm, correct?

5 A. It's a theoretical storm that's -- you know,
6 all of these design storms are theoretical. You have
7 to look at what possibly could happen. At Addicks and
8 Barker they used a three-day -- a 72-hour storm with 44
9 inches being the spillway design flood and looked at
10 that and analyzed that compared to the capacity of the
11 auxiliary spillways.

12 Q. And so you know that the last time the
13 spillway design flood was recalculated before Harvey
14 was 1977, right?

15 A. That's my understanding.

16 Q. Okay. And it's your position that then at
17 the time of Harvey, these spillways could still safely
18 pass the spillway design flood? That's your position?

19 A. That is my understanding, yes.

20 Q. Okay. Let's go to -- we're already at JX 2.
21 Let's go to PDF page 46. This page 7-1 of the Water
22 Control Manual talks about the spillway design flood
23 impacts. And we're going to start reading about
24 halfway down the page, a preliminary revision.

25 Mr. Bardol, a preliminary revision -- I'm

1 going to read this and tell me if I get anything wrong
2 here.

3 A. Okay. Are you starting at the top or...

4 Q. No. About halfway down. I'm going to --
5 sorry, under section (a) called "Spillway Design Flood
6 Impacts."

7 A. Okay.

8 Q. And then let's look about a halfway down and
9 I'm going to read this sentence to you.

10 It states "A preliminary revision to the
11 spillway design flood in 1967 and an approved revision
12 in 1977 both produced flow over the embankments of the
13 dams. The occurrence of this situation could create a
14 condition favorable for considerable property damage to
15 the public and possible loss of life."

16 You'd agree that the text of this Water
17 Control Manual describes that the occurrence of a
18 spillway design flood even in 1977 involved possible
19 loss of life, correct?

20 A. In 1977, that's when it was first looked at.
21 But then there was subsequent improvements to the dam
22 in 1980s where they did -- at the time in '77 there was
23 not roller-compacted concrete at the auxiliary
24 spillways and there was subsequent improvements to
25 those to be able to pass the spillway design flood up

1 to that elevation of I think it was 115 was...

2 Q. And so you -- yeah, you mentioned that on
3 Friday that 115 is in your opinion the capacity of the
4 reservoirs, right?

5 A. I wouldn't say it's -- I mean it's my
6 opinion, but it's based on what's published within the
7 Emergency Action Plan, those tables at the back that
8 shows the spillway design flood and the corresponding
9 volume and elevation within. So it's not my opinion
10 independent of looking at the information that's
11 presented within the Emergency Action Plan.

12 Q. Okay. And did you look at the Water Control
13 Manual as to how it defines storage capacity?

14 A. It's in the -- if I can look at the...

15 Q. It's a simple yes-or-no question. Did you
16 look at it in preparing your report in this case how
17 the Water Control Manual defines storage capacity?

18 A. Did I look at the Water Control Manual, yes.
19 I looked at the Emergency Action Plan and I also looked
20 at the Water Control Manual.

21 Q. And so what you opined on Friday about the
22 storage capacity was based on the Emergency Action Plan
23 but not the Water Control Manual, correct? In regard
24 to storage capacity?

25 A. I don't know if I would exclude that I didn't

1 use it but when I was referencing it on Friday with
2 those elevations and the volumes, I was specifically
3 referencing I think it was Appendix C of the Emergency
4 Action Plan where it gives those very defined
5 elevations, water volumes, and then defines what that
6 elevation is.

7 Q. Okay. So we'll go check those out in a
8 moment. But I want to follow up on this idea of the
9 improvements, the sort of adding of concrete to the
10 emergency spillways in the 1980s.

11 A. Okay.

12 Q. Okay. So are you suggesting that the
13 emergency spillways are in the same condition that they
14 were in the '80s?

15 A. I guess I'm not suggesting. What I'm stating
16 is in the 1980s that they were improved for that
17 specific capacity to be able to pass. But then going
18 back to the condition of those, you know, there's
19 operational maintenance of maintaining those spillways.
20 I haven't seen anything else that they were
21 deteriorated or were of concern from passing that.

22 Q. And you didn't look into that, did you?

23 A. I didn't see any information. I looked at
24 the information that was available and I didn't see
25 anything that the spillways at the time were

1 compromised or anything less than what the capacity was
2 being designed for.

3 Q. Okay. And when you say "at the time," you
4 mean at the time of Harvey?

5 A. Correct.

6 Q. Okay.

7 A. Correct.

8 Q. And then you said -- okay.

9 Now, if we go to the last sentence of this
10 paragraph up on the screen, it's page 7-1 of the Water
11 Control Manual, it states that "Spillway design flood
12 impacts are currently being reanalyzed as part of a dam
13 safety modification study and this manual will be
14 updated with results from the study after it's reviewed
15 and approved."

16 Now, you talked about that dam safety
17 modification report on Friday.

18 Do you remember that?

19 A. Yes, I do.

20 Q. And you cited from it?

21 A. Yes, I did.

22 Q. And you'd agree that it's a corps document?

23 A. Yes.

24 Q. And it's an accurate document?

25 A. Yes.

1 Q. So let's go back to these reservoirs on the
2 map. So we just talked about the emergency spillways
3 and how when water rises up too high it can sort of
4 flow around the ends of the dams.

5 Now, I want to ask you, gates were added to
6 all of the conduits in approximately 1962; is that
7 right?

8 A. Correct, in the 1960s, yes.

9 Q. Okay. And before that, in the original
10 construction, all of the openings on the dam were not
11 gated, correct? Some were, but most weren't?

12 A. That's my understanding, yes.

13 Q. Okay. And so that allowed water to always
14 flow through the dam even when there was a bad storm,
15 correct?

16 A. Correct. It would be restricted, but there
17 was no gate to stop flow, correct.

18 Q. Okay. And you just touched on something.
19 The flow would be restricted by the dams, correct,
20 before it flowed downstream?

21 A. That is correct, yes.

22 Q. And that means that before there were gates,
23 if a, you know, sort of large inflow came in, the dam
24 could still protect downstream by reducing the flow to
25 downstream; is that correct?

1 A. That was the intent, yes.

2 Q. And the project worked like that for
3 approximately 20 years, correct?

4 A. It functioned that way, yes.

5 Q. Okay. And it provided protection to
6 downstream properties in that way, correct?

7 A. Compared to without dam, yes, it provided
8 some protection, yes.

9 Q. And the kind of specific type of protection
10 is it reduced the peak flow of floods, correct?

11 A. Compared to without them, yes.

12 Q. Okay. Now, during the Harvey event, the
13 gates were closed on the dams on August 25th, correct?

14 A. Yes, they were closed.

15 Q. Okay. And closing of the gates at that time
16 was called for by the Water Control Manual, right?

17 A. Yes, it was.

18 Q. And then once the gates were closed on the
19 25th, pursuant to the Water Control Manual, the dams
20 were holding back water that would have otherwise
21 flowed downstream, correct?

22 A. That is correct, yes.

23 Q. Now, water exceeded the government-owned land
24 upstream of the reservoirs during the Harvey event,
25 correct?

1 A. It did, yes.

2 Q. Okay. And it started -- do you know what
3 date it started exceeding the government-owned land?

4 A. I have it in my report if you want me to look
5 at it. I just don't recall off the top of my head the
6 actual date.

7 Q. Okay.

8 A. I believe it's in Section 3 where I go
9 through a timeline.

10 Q. Yes. It's actually Section 4.

11 A. Okay. Section 4.

12 Q. Mm-hmm.

13 And why don't we turn to your report. It's
14 Section 4, page 4-25. And let's look to the very
15 bottom of that page and we'll put it up.

16 And, Mr. Bardol, do you have something there?

17 A. I just had a copy of my report here.

18 Q. Okay. Does it have any notes in it?

19 A. I think I have -- I might have a couple like
20 circles on a few things.

21 Q. Okay. If we end up talking about a page
22 today and you're looking at something that has a note,
23 I'd ask you to let me know that.

24 A. Oh, sure. Definitely.

25 Q. Okay. And we're going to turn to page 4-25

1 of your report.

2 And so according to your report, you'd agree
3 that water was off government-owned land at least by
4 the 28th?

5 A. Yes.

6 Q. Now, in fact, at Addicks Reservoir, the
7 reservoir left government-owned land on August 27th?

8 A. That's correct, yes.

9 Q. Okay. And the reservoir left the
10 government-owned land at the Barker Reservoir by
11 August 29th; is that right?

12 A. That is correct, yes.

13 Q. Okay. And it was forecast to leave
14 government-owned land in the days prior to that,
15 correct?

16 A. Yes, when looking at the weather forecast,
17 they had sufficient information, yes.

18 Q. Okay. The corps was running models to
19 prepare forecasts for what might occur in the storm,
20 correct?

21 A. Yes.

22 Q. And it was using rain information from the
23 National Weather Service, correct?

24 A. That's my understanding, yes.

25 Q. Okay. And would you agree with me that by

1 August 23rd, the reservoir was forecast to leave
2 government-owned land at Addicks Reservoir?

3 A. What was the date again? You said August --

4 Q. August 23rd.

5 A. What was the question again?

6 Q. By August 23rd, the reservoir pools at
7 Addicks Reservoir were forecast to exceed
8 government-owned land, correct?

9 A. I'm not familiar with the August 23rd date.

10 Q. Okay. So you don't know what the forecast
11 said on August 23rd, do you?

12 A. I don't recall off the top of my head.

13 Q. Did you --

14 A. I remember looking at a lot of reports, but I
15 don't remember what date they were predicting when.

16 Q. Okay. But you do agree that the reservoirs
17 were forecast to exceed government-owned land earlier
18 in the storm than they actually did?

19 A. That's my understanding, yes.

20 Q. Okay. Now, water had -- once water exceeded
21 the government-owned land at both of the reservoirs
22 during the Harvey event, it began flooding homes
23 upstream of the reservoirs, correct?

24 A. Correct, yeah, as predicted. It backed up
25 upstream of the reservoirs.

1 Q. And water had never flooded homes upstream of
2 the dam in their entire history, correct?

3 A. That's my understanding, correct.

4 Q. And starting on August 26th, flows were
5 forecast to flow around the end of Addicks Reservoir
6 right here, right?

7 A. On the north end, yes --

8 Q. Yeah.

9 A. -- that is correct.

10 Q. And then on August 29th, they actually did
11 flow around the end of the reservoir, correct?

12 A. Yes, they did.

13 Q. You know that the forecast on August 28th
14 showed that the flow around the end was forecast at
15 22,000 cubic feet per second, correct?

16 A. Could you give those -- the numbers again
17 there?

18 Q. On August 28th, the corps' reservoirs
19 forecast, the CWMS forecast, forecast that the flow
20 around the end of the Addicks north spillway was going
21 to be 22,000 cubic feet per second, correct?

22 A. I don't recall that number, 22,000. I know
23 there was -- they estimated about 20- -- or 2,000 cfs
24 that would be flanking around, but I'm not familiar off
25 the top of my head with the 22,000 cfs.

1 Q. And so, Mr. Bardol, the 2,000 refers to an
2 estimate of what actually occurred during the event,
3 correct?

4 A. Correct, yes.

5 Q. And so you don't have any knowledge of what
6 was forecast to go around the end of the dams on
7 August 28th, do you?

8 A. Right now, I don't remember that off the top
9 of my head as far as the forecast of 22,000 cfs.

10 Q. Okay. And on August 28th, you know that
11 those forecasts showed over 50 inches of rain were to
12 come at the reservoirs, correct?

13 A. I don't recall the exact number that -- the
14 inches that were forecasted, no.

15 Q. And so you didn't review those forecasts as
16 part of your work in this matter?

17 A. It's not that I didn't review those. I just
18 don't recall it right -- I looked at them six years ago
19 to be honest so I don't recall that elevation.

20 Q. Let's go to DX 213.

21 Mr. Bardol, I've got up on the screen DX 213.
22 It's a compilation of one CWMS forecast transmission
23 for sort of each one sent during the storm.

24 And you said you reviewed CWMS forecast for
25 this case, correct?

1 A. Underneath the initial document production,
2 yes.

3 Q. Okay. So let's go to the CWMS forecast for
4 August 28th and the Bates number is 5409. You'd agree
5 that the first sentence states "The Addicks and Barker
6 watersheds have received 25 to 28 inches across the
7 watersheds since the beginning of the event."

8 It says that, right?

9 A. It does, yes.

10 Q. Okay. And then the last sentence states "The
11 seven-day accumulation for this forecast is 25 inches
12 as received from the River Forecasting Center."

13 Correct?

14 A. That is correct.

15 Q. And if we take the two -- the rain on the
16 ground added to the rain amount that is forecast,
17 you've got 50 to 53 inches of rain that is expected for
18 the reservoirs, correct?

19 A. Yes, adding those numbers, yes.

20 Q. Okay. And if we move to the next paragraph,
21 the second paragraph, I'm going to read the second
22 sentence to you. It says "We are expected to have
23 water around the north end of Addicks later tonight
24 with peak flows of about 22,000 cfs Friday morning."

25 I read that correctly, didn't I?

1 A. You did, yes.

2 Q. Now, when you talk about flanking flows, your
3 report calls them flanking flows or uncontrolled
4 releases, right?

5 A. Correct, yes.

6 Q. And that's because the water is flowing
7 around the ends of the dams, correct?

8 A. That is correct, yes.

9 Q. And it's not controlled by the dams at that
10 point, right?

11 A. Correct. It's not going through the gated
12 controlled -- the conduits that are gated, so it's
13 flanking around that's uncontrolled.

14 Q. Okay. And just to be clear, the two areas
15 marked as "outlet" right here at the sort of eastern
16 side of Barker and the southern side of the Addicks
17 Reservoir on PX 405, that is where the gates are,
18 correct?

19 A. That is correct, yes.

20 Q. And the emergency spillways marked in blue
21 here on PX 405, they don't have any gates, right?

22 A. That is correct. They're just
23 roller-compacted concrete for a spillway, yes.

24 Q. And when water starts to go around them or
25 over them, the corps can't stop that by operating those

1 spillways, correct?

2 A. Correct, yes.

3 Q. Now, flanking flows start to happen at
4 Addicks Reservoir at elevations higher than 108 feet,
5 correct?

6 A. Yes, that is correct.

7 Q. Okay. And that's because the end of the dam
8 right here, the north end of Addicks, is approximately
9 108 feet, right?

10 A. Correct, yeah, we saw that picture with the
11 structure and the concrete that was elevation 108, yes.

12 Q. Right.

13 And so any time the reservoir is beyond 108,
14 that means that water will start making uncontrolled
15 releases around the end of Addicks, correct?

16 A. It would flow around the end, yes.

17 Q. Okay.

18 A. Correct.

19 Q. Now, let's talk about Barker briefly.

20 At Barker, the end of the dams for the
21 emergency spillways here, that elevation is 108,
22 correct?

23 A. I --

24 Q. Oh, excuse me. It's not 108. It's 104,
25 isn't it?

1 A. Correct, yeah, it's a different elevation,
2 yes.

3 Q. Yes.

4 Okay. So the end of the dams at Barker
5 Reservoir is 104 and, therefore, any time water backs
6 up behind Barker Reservoir and goes around the ends --
7 excuse me, once it backs up behind it at an elevation
8 higher than 104, it will go around the ends; is that
9 right?

10 A. Yes, it would flank around the flow -- around
11 the auxiliary spillways, yes.

12 Q. And that flanking is also called an
13 uncontrolled release?

14 A. Correct, yes.

15 Q. Now, water has -- well, would you agree that
16 uncontrolled releases can cause property damage?

17 A. They can, yes.

18 Q. And uncontrolled releases can put people's
19 lives at risk?

20 A. They could with the flooding and that's what
21 the Emergency Action Plan is for, notifications of
22 what's going to be happening.

23 Q. So you mentioned that uncontrolled releases
24 can put people's lives at risk and that's what the
25 Emergency Action Plan is for?

1 A. Underneath the Emergency Action Plan there's
2 a notification process to warn people with flooding,
3 just as like downtown Houston and other areas, there's
4 usually a notification if certain elevations, rivers
5 hit a certain elevation, there's a notification to warn
6 people of what those elevations where the flooding is,
7 and there's -- it's my understanding underneath the
8 Emergency Action Plan there's a notification process
9 before flanking flows that individuals are notified.
10 Also then I think the City of Houston, I don't recall
11 all of the individuals, but there would be a formal
12 notification process of who's notified when those would
13 occur.

14 Q. Right.

15 And so when uncontrolled or releases or
16 flanking flows are predicted, the Emergency Action Plan
17 provides for action the corps needs to take; is that
18 right?

19 A. Correct, yeah, just like when there was
20 that -- that building that was up there we saw
21 yesterday, once it starts to occur in advance, if it's
22 going to occur, Emergency Action Plan is notification
23 that this is going to happen, there's going to be water
24 that's flowing up in that area.

25 Q. And that's because water flowing around that

1 area is an emergency, right?

2 A. I don't know if I -- there's a difference
3 between there's an emergency for just pure flooding. I
4 mean throughout Houston with all the flooding, I guess
5 emergency -- emergency responders are there with the
6 flooding, but then for the dam itself, you know, I
7 don't think the flanking flows itself would constitute
8 emergency for the safety of the dam itself. It's a
9 situation that has to be notified so that way people
10 can respond, extended watch, et cetera.

11 Q. So are you saying that it is -- it is a
12 safety concern but it's not related to dam failure? Is
13 that what you're saying?

14 A. For the general public, yeah, I mean, anytime
15 that there's flooding, it's a safety concern for
16 people's, you know, health, safety, being stuck in the,
17 you know, flooding event. But just distinguishing it
18 from the spillway itself of flanking flows, my
19 understanding of looking at the information, the
20 improvements that were done, just having flanking flows
21 wasn't an emergency for dam safety for the dam failure
22 after the improvements were done.

23 Q. And so -- okay. So we'll talk more about the
24 EAP in a little while. Let's keep moving here.

25 THE COURT: Can I ask --

1 MS. DUNCAN: Sure.

2 THE COURT: This area here is where we are
3 talking about flanking flows?

4 MS. DUNCAN: Yes.

5 THE COURT: And was anything done there that
6 can controls that or is that just regular neighborhood
7 that is...

8 MS. DUNCAN: Your Honor, I'll ask a few
9 questions.

10 BY MS. DUNCAN:

11 Q. Mr. Bardol?

12 MR. McGEHEE: Object, Your Honor. I'd like
13 the judge's question to be answered.

14 MS. DUNCAN: Okay. I was going to ask
15 questions to get at it.

16 THE WITNESS: Okay. Yeah, I just want to
17 make sure I'm following the right protocol answering to
18 who.

19 Yes, at the north end where the blue line is
20 there's nothing that can be done to control it so it's
21 just roller-compacted.

22 THE COURT: Okay. This is that area?

23 THE WITNESS: Correct, yeah, that was the
24 picture we saw with that outbuilding, the metal
25 building and then the concrete that meets grade when

1 water fills up, it starts to flank around the
2 uncontrolled releases and go around.

3 THE COURT: Yeah.

4 THE WITNESS: There's nothing that the corps
5 can do to stop that. But it's designed as the
6 auxiliary spillway when it does get past the 108 --

7 THE COURT: Yeah.

8 THE WITNESS: -- before it gets to the
9 spillway design flood it would flank that way so it
10 goes over the dam that's encased in concrete to protect
11 it from eroding unlike the other portion of the dam
12 that's just earth.

13 THE COURT: Where is this portion? This
14 portion here, there isn't concrete in the green area?

15 THE WITNESS: Correct. The green area, I
16 have it cross overlaid, but the primary part of the
17 green is just earthen embankment and then there is a
18 roadway on top but it's not protected to allow flows to
19 go over that.

20 THE COURT: Okay.

21 THE WITNESS: The blue area is the auxiliary
22 spillways, that's protected with concrete.

23 THE COURT: Okay. Thank you.

24 THE WITNESS: You're welcome.

25

1 BY MS. DUNCAN:

2 Q. Now, Mr. Bardol, I've got a follow-up
3 question for you.

4 A. Yes.

5 Q. Just looking at PX 405, if you look around
6 the top of this map, if you look at flows that might
7 flow around the end of this dam, there are homes and
8 business in this area, aren't there?

9 A. Yes, there's homes and business above -- the
10 government-owned land only goes up to a certain
11 elevation. The 108 where it starts to flank, that's
12 higher than and there's been encroachment on both the
13 upstream. I think the 2009 operational assessment kind
14 of talks through that between properties upstream of
15 the reservoirs having encroached within the impoundment
16 area. And then just where it would flank there's also
17 been encroachment into that area, yes.

18 Q. Okay. And so when water flanks in an
19 uncontrolled manner around the ends, that is going to
20 inundate residential and commercial properties,
21 correct?

22 A. As it flows around, yes, there's residential
23 and commercial properties that would receive some of
24 the flow.

25 Q. Okay. And you mentioned again I think that

1 it's okay for water to go over these emergency
2 spillways because they've got concrete on them? Is
3 that what you said?

4 A. I wouldn't say "okay." I mean, they've been
5 designed for that. I mean, prior to the improvements
6 back in like the '62, they were just earthen, so there
7 was concern for the dam safety as it flanked, the
8 uncontrolled releases, that it could scour.

9 So in the 1980s and through studies kind of
10 condensing a lot of reports and, you know, looking at
11 it in the 1980s, they were improved to have
12 roller-compacted concrete so that way there wasn't that
13 concern of scour and erosion as water would flow over
14 the auxiliary spillways. So it was designed to protect
15 the dam itself.

16 Q. And you said you wouldn't say it's okay for
17 that. Are you suggesting it's -- well, let me go back
18 to one other thing.

19 A. I was just using the word "okay." It's a
20 flooding event. I mean flooding is not okay. So I
21 just didn't want to use a general term of it being okay
22 or good or bad. It's just designed to withstand a
23 certain flow up to the spillway design flood to protect
24 the safety of the dam.

25 Q. Okay. And you mentioned what I think is sort

1 of a universally held belief that flooding is not okay,
2 right?

3 A. Flooding is bad, yes.

4 Q. Yes.

5 A. Flooding is not good but when you have a
6 large storm such as that, you're trying to protect as
7 many properties as possible. And that's where you have
8 the Emergency Action Plan, you have notification
9 procedures, and you have process to follow.

10 THE COURT: I guess if you have a rice
11 plantation, a little flooding is okay.

12 MS. DUNCAN: I'm from a family of rice
13 farmers too, Your Honor.

14 BY MS. DUNCAN:

15 Q. So, Mr. Bardol, elevation -- you mentioned
16 that these uncontrolled releases around the north end
17 of Addicks Dam begin at elevation 108 up to the
18 spillways design flood of elevation of 115, correct?

19 A. Those are the elevations in the report. So
20 108 is where the flanking flows begin. And then up to
21 115 is where the spillway design flood has been
22 analyzed up to hydrologically, yes.

23 Q. Okay. Now, water has never flowed around the
24 ends of any of the -- either of the dams in history of
25 the dams, correct?

1 A. That's my understanding, yes, correct.

2 Q. And if we go back to sort of the timeline of
3 events, you know, we've talked about the gates being
4 closed on the 25th, correct?

5 A. Yes.

6 Q. But then the pools hit the induced surcharge
7 elevations and releases began early morning
8 August 28th, correct?

9 A. Yes, it was very early the 28th.

10 Q. Okay. And that 28th is the same day, of
11 course, that we looked at the forecast and there was
12 over 50 inches of rain in the forecast, correct?

13 A. Yes, I believe the one that you showed on the
14 screen, yes.

15 Q. And the 28th is also the day where there was
16 22,000 cubic feet per second of water slated to flow
17 around the ends of the dams, correct? The end of --
18 north end of Addicks Dam?

19 A. Maybe one clarification. That was the date
20 that -- that was the date that they started to predict
21 that it potentially could get that, not that it would
22 occur on that day. I think that's maybe --

23 Q. That's correct. It was forecast, right?

24 A. Yeah, potentially in the future. But they
25 were still monitoring it, but that was the date that

1 they said potentially if it keeps getting worse, it
2 could go out that way. But it wasn't going to happen
3 on that day.

4 Q. Got it.

5 And after the releases began on the early
6 morning of August 28th, you know that the reservoir
7 pools kept rising, right?

8 A. They were being monitored, yes, they were
9 rising, yes.

10 Q. Okay. And they rose -- they kept rising on
11 the 29th, right?

12 A. Yes.

13 Q. And they kept rising up until they peaked on
14 the 30th, correct?

15 A. Yes, that's correct.

16 Q. So for approximately two days after releases
17 began, the pools kept rising, correct?

18 A. They were rising even though the rain had
19 stopped. So the rain had passed, had stopped, and it
20 was still rising because there was still inflow of
21 water from the watershed.

22 Q. Okay. And so the water that was in these
23 reservoirs during Harvey was based on inflow flowing
24 in, correct?

25 A. That is correct, yes.

1 Q. Okay. And the corps during a storm can't
2 control how much water, how much inflow comes into the
3 reservoirs, can it?

4 A. They can't control it, but they're just --
5 they're doing their best to predict it, yes.

6 Q. Now, the peak flow that came out of the
7 reservoirs at the gated outlets during the storm, that
8 the peak -- combined peak was estimated to be 13,800
9 cfs?

10 A. Yes, that's correct.

11 THE COURT: Let me just ask to clarify. I
12 don't know how relevant it is. But when did the flow
13 start going down? It peaked you said on the 30th.
14 When did it actually begin to decline?

15 THE WITNESS: The elevation of the reservoirs
16 --

17 THE COURT: Yeah.

18 THE WITNESS: -- or the flow coming out?

19 THE COURT: The elevation.

20 THE WITNESS: I would have to look at a
21 chart, if you don't mind.

22 BY MS. DUNCAN:

23 Q. Well, can you just let us know for the record
24 what are you looking at?

25 A. Yeah. I'm looking at my report. I'm just --

1 Q. And which portion of your report?

2 A. I'll let you know as soon as I find it. I
3 think it's in Section 6 where I go through the --
4 Section 5 I have both of the output of models. Let me
5 just find that.

6 Q. And you mentioned -- while you're finding
7 that, let me just put some context to this. You
8 mentioned you're looking at the output of your models;
9 is that right?

10 A. I have a few graphs that show as far as when
11 the reservoirs hit their peak and started to go down,
12 so...

13 Q. And just to give the court some context, you
14 modeled flood inundation in two scenarios; is that
15 right?

16 A. I did, yes.

17 Q. And one would be the sort of project as it
18 operated during the storm, correct?

19 A. Correct, the actual Harvey event and then we
20 modeled a gates-closed scenario.

21 Q. Okay. And we'll talk more about that, but
22 just for context as to what you're looking at to answer
23 the court's question.

24 A. Okay. Thanks. As soon as I find the table,
25 I'll let you know.

1 So I'm looking at figure 41 in my report.
2 This is in Section 4.

3 THE WITNESS: So the flanking started, Your
4 Honor, on 8:29 on the 29th, and then it continued to
5 rise up until August 30th at 7:30 and it peaked at
6 elevation 109.1. After that, then it started to go
7 down. And then it continued to flank up until
8 September 1st. So it peaked and then after the 8/30 it
9 started to decline.

10 THE COURT: So 8/30 was the peak and the
11 beginning of the decline, and then it -- when did it
12 get back to normal height?

13 THE WITNESS: Oh, much later. They continued
14 to drain it for -- I'd have to look of what date that
15 they actually closed. It was in September when they
16 ended up getting back to normal flood control
17 operations and then they shut the gates again and then
18 they, you know, then they went back to the standard
19 flow that would -- or the nondamaging flows that would
20 get it back down to like about 2,000.

21 THE COURT: Okay.

22 THE WITNESS: But it was well into September.

23 THE COURT: Okay. Thank you.

24 BY MS. DUNCAN:

25 Q. So let's talk about that peak pool in

1 relation to other storms.

2 Mr. Bardol, the reservoir pools generated
3 during the Harvey event were the highest pools in the
4 history of the reservoirs, correct?

5 A. That is correct, yes.

6 Q. And the second highest set of pools was from
7 the year before; is that correct?

8 A. I believe it was, yes.

9 Q. And it was 2016 storm called the Tax Day
10 Storm, correct?

11 A. I believe that's correct, yes.

12 Q. Let's turn to PX 14 at PDF 11.

13 Mr. Bardol, if we -- we're back to the list
14 of files that according to your report serve as the --
15 a basis for your opinions, correct?

16 A. Yes, that's correct.

17 Q. Okay. I'd like to look at the eighth bullet
18 down or the third from the bottom, you list a "USACE
19 Hurricane Harvey Flood Inundation Mapping After Action
20 Report" from 2018, correct?

21 A. I do list that, yes.

22 Q. Okay. Let's go to that document. It's JX
23 54.

24 Now, this report at the bottom of the report
25 states that it was prepared by the U.S. Army Corps of

1 Engineers, correct?

2 A. Yes, correct.

3 Q. And the date on is it March 2018, correct?

4 A. That is correct, yes.

5 Q. And let's move to PDF page 3. And you note
6 in the top right corner, there is a logo, isn't there?

7 A. There is, yes.

8 Q. It's called "InFRM," and it stands for
9 Interagency Flood Risk Management, correct?

10 A. That's correct, yes.

11 Q. And it's -- InFRM is a name given to a formal
12 regional partnership between FEMA, National Weather
13 Service, Army Corps of Engineers, and United States
14 Geological Survey, correct?

15 A. That is correct, yes.

16 Q. And the first sentence of this first
17 paragraph, the top of page 2 states "Flooding remains
18 the leading cause of loss by natural disaster across
19 the United States."

20 Correct?

21 A. That is correct, yes.

22 Q. Okay. Let's look down to Section 2.1. And
23 first let's just start with the figure right there in
24 the middle of the page.

25 MS. DUNCAN: Can we zoom in on that,

1 Mr. Jackson. Thank you.

2 BY MS. DUNCAN:

3 Q. Figure 2.1 is Harvey making landfall in Texas
4 as a Category 4 hurricane, correct?

5 A. That's correct, yes.

6 Q. Now, the paragraph just underneath that
7 photo, figure 2.1, states that the storm stalled --
8 excuse me, "The storm then stalled with its center over
9 or near the Texas coast for four days, dropping
10 historic amounts of rainfall over parts of southeastern
11 Texas."

12 Is that correct?

13 A. Yes, that is correct, yes.

14 Q. It goes on to state that "Harvey was the most
15 significant tropical rainfall event in United States
16 history both in scope and peak rainfall amounts since
17 reliable rainfall records began around the 1880s."

18 Correct?

19 A. That is correct, yes.

20 (Technical interruption.)

21 THE COURT: Someone is supposed to press *6.
22 Where is *6? Or who is that?

23 MS. DUNCAN: I'm not sure, Your Honor. It
24 might be affiliated with the video conference.

25 THE COURT: Maybe, but it's unlikely we would

1 have someone other than the law clerks who are back in
2 DC listening to it. One of the other judges wanted to
3 listen to it Friday, but not today.

4 THE CLERK: I believe it's resolved now.

5 THE COURT: It's what?

6 THE CLERK: It's resolved.

7 THE COURT: Okay. Whatever it is.

8 BY MS. DUNCAN:

9 Q. So let's keep going. Let's talk about the
10 next sentence. It says "Figure 2.2 shows NOAA
11 gauge-corrected precipitation estimates for Harvey in
12 inches for the period of 25 August to 1 September,
13 2017."

14 Correct?

15 A. Yes, that's correct.

16 Q. Okay. And if we look then to document page 4
17 at figure -- excuse me, page 3, figure 2.2, that's the
18 map that's being referred to?

19 A. Yes, that's correct.

20 Q. Okay. And if we look, I'd like to now talk
21 about figure 2.3, but let's stay on this page and see
22 what the text says about it. If we look at the
23 paragraph just under figure 2.2, let's read the fourth
24 sentence. It starts with "The National Oceanic and
25 Atmospheric Administration recently completed an

1 analysis of the annual exceedance probability of
2 Harvey's rainfall in southeastern Texas which showed
3 that a large portion of that area experienced a
4 rainfall with less than a 1 in 1,000 or .1 percent
5 chance of occurring in any given year as shown in
6 figure 2.3."

7 I stated that correctly, didn't I?

8 A. You did, yes.

9 Q. And if we look at figure 2.3 on the next
10 page, there is a map, isn't there?

11 A. There is a map, yes.

12 Q. Okay. And the areas in which -- and Houston
13 is about in the center of that map, correct?

14 A. It is, correct, yes.

15 Q. Okay. And the map has some helpful highways
16 in red that are listed on this map, correct, at figure
17 2.3?

18 A. It does, yes.

19 Q. Okay. And you can see, that there is a sort
20 of circle around Houston, in red, do you see that?

21 A. I do, yes.

22 Q. Would you say that's possibly Beltway 8?

23 A. Yes, one of the major highways around it,
24 yeah.

25 Q. Okay. And you know that Addicks and Barker

1 Reservoir are just sort of to the west and north of
2 Beltway 8, correct?

3 A. Correct, yes.

4 Q. Okay. And, therefore, that puts Addicks and
5 Barker Reservoirs within the dark blue color of this
6 map, correct?

7 A. The reservoirs and then the upland tributary
8 area. I don't know the scale on this. Some of that
9 would be to the west of that. But the reservoirs would
10 be.

11 Q. Okay. And then, therefore, that means that
12 for the rainfall over the reservoirs, according to the
13 NOAA's analysis, it would be a rainfall with less than
14 a 1 in 1,000 chance of occurring in any given year,
15 correct?

16 A. For in this dark blue, I mean I just want to
17 make sure I'm being clear, so that is and then part of
18 the upland watershed that's coming into it, some of it
19 might be less on this because it's kind of more of, you
20 know, how it happened a lot of the rainfall, the intent
21 was Houston and then east.

22 THE COURT: Let me ask one other question
23 here. Is the use of a dam in this section -- here's
24 Houston, and is this the dam in this section?

25

1 BY MS. DUNCAN:

2 Q. Mr. Bardol, you know that the dam is actually
3 in the dark blue area closer to the red circle around
4 Houston, right?

5 A. The dam itself, but then the tributary area I
6 think is like 130, 136 square miles, so part of that
7 would be to the west. So some of it is in the dark and
8 then some of it is in the green, so it's kind of -- it
9 has a mix of what's coming into it.

10 THE COURT: So it's the north of the
11 Houston -- northwest corner of Houston or...

12 THE WITNESS: The reservoirs are mostly west
13 but, you know, a little north. But, yeah, west of
14 Houston. And they're located within the blue. But
15 then the tributary areas, the very large area we talked
16 before about how the -- the tributary area coming in is
17 to the west of that.

18 BY MS. DUNCAN:

19 Q. And, Mr. Bardol, just to make sure the record
20 is clear, there are three shades of blue on here.

21 A. Yes.

22 Q. The reservoirs themselves are located within
23 the darkest shade of blue, correct?

24 A. The reservoirs themselves and downtown and
25 Houston is. And then I don't have a scale here, but

1 there is multiple shades of blue and green, that would
2 be the tributary area coming in.

3 Q. Okay. Now, if we go back to the page --
4 well, let's see. Let's go to the next page, page
5 document page 7 -- 5. Excuse me. And that's PDF 6.

6 Okay. Why don't we just start at the bottom
7 and look at the picture here for a moment. Figure 2.4
8 is a picture of flooding near downtown Houston during
9 Hurricane Harvey, isn't it?

10 A. This is downtown Houston, yes.

11 Q. Is that a semitruck in the bottom right-hand
12 corner?

13 A. It is, yes.

14 Q. Okay. And in the very middle of the page, is
15 that somebody kayaking near the highways in Houston?

16 A. It's a boat or watercraft, yeah.

17 Q. And on the -- just to the north and to the
18 east of the flooded semi, is that sort of construction
19 equipment that you see?

20 A. It looks that way, yeah. This is downtown
21 Houston, downstream of the reservoirs in the heart of
22 where the dark blue was, yes.

23 Q. Okay. So let's go back to the top of the
24 page.

25 THE COURT: Yeah, it looks like the kind of

1 equipment they used to hang signs and fix stoplights
2 with the little cage there.

3 MS. DUNCAN: Yes.

4 BY MS. DUNCAN:

5 Q. Mr. Bardol, I've seen the orange piece --
6 I've heard the orange piece of equipment called a
7 cherry picker. Do you know what the technical term for
8 that piece of quick is?

9 A. That could be it. I mean, yeah, it's a lift,
10 personnel lift, but, yeah.

11 Q. Okay. So if we look at the top part of the
12 document, page 5, Section 2.2 talks about the
13 hydrologic impacts of Hurricane Harvey, correct?

14 A. Yes.

15 Q. And the first sentence states "These rains
16 caused catastrophic flooding throughout the Texas Gulf
17 Coast."

18 Correct?

19 A. Correct, yes.

20 Q. And the next sentence actually starts to
21 speak specifically about Harris County and the City of
22 Houston, doesn't it?

23 A. It does, yes.

24 Q. Okay. And it states that "At least seven
25 major river basins across the region experienced major

1 flooding during Hurricane Harvey in addition to all of
2 the creeks and bayous in Harris County," and in
3 parentheses it notes "(which includes the city of
4 Houston)."

5 Correct?

6 A. It does, yes.

7 Q. It goes on to talk --

8 MR. McGEHEE: Objection, Your Honor. Your
9 Honor, for the last 20 minutes or so, we've been
10 talking about the impact and the forecast and downtown
11 Houston way, way, way beyond those two questions the
12 court has asked. So I would object based on relevancy.

13 MS. DUNCAN: Your Honor, this is a report
14 that Mr. Bardol himself referenced and relied on and it
15 is relevant to the context of whether this was an
16 emergency or not.

17 THE COURT: Well, I think that's legitimate,
18 but we are going into the flooding to an extent that
19 doesn't directly relate to the issue in the court, so
20 I'll allow it. But let's move on because we know how
21 bad the flooding is. I think the court understands
22 that and the record is replete with stuff on that.

23 MS. DUNCAN: Okay. Your Honor, may I make
24 just two more points on this document?

25 THE COURT: Okay. Yes.

1 BY MS. DUNCAN:

2 Q. Now, Mr. Bardol, if you move on to page 2.3,
3 you'd agree that the second sentence of the first
4 paragraph, second and third sentence notes that
5 Hurricane Harvey is responsible for 68 deaths in Texas
6 and over half of those, 36, were in the Harris
7 County -- in Harris County in Houston Metro area,
8 correct?

9 A. Yes, correct. And this is -- I don't have
10 the location here, but this is within the whole Houston
11 Metro area that this is looking at.

12 Q. And then the last point I want to note is if
13 we move on to figure 2.5 at the next page, you note
14 that figure 2.5 is titled "Water Rescues in Houston
15 During Hurricane Harvey," correct?

16 A. That is the title there, yes.

17 Q. Now, we talked about a moment ago with the
18 judge that the reservoirs didn't drain all the way in
19 early September, right?

20 A. Correct, yes.

21 Q. They didn't even drain all the way in late
22 September, right?

23 A. Correct.

24 Q. They didn't drain until I believe, what, late
25 October or November?

1 A. I'd have to look at the data. I don't have
2 the exact date, but it was late.

3 Q. Okay. Now, you're aware that at the time of
4 the Harvey event there was another hurricane forming in
5 the Atlantic Ocean, correct?

6 MS. DUNCAN: Sorry. Just one moment. Why
7 don't we see if we can fix...

8 BY MS. DUNCAN:

9 Q. Okay. Mr. Bardol, you're aware at the time
10 of the Harvey event another hurricane was forming in
11 the Atlantic Ocean?

12 A. It was during the hurricane season so I think
13 there was one out there, but I don't know the specifics
14 of the forecast of that time or the probability of
15 where that was going.

16 Q. You note it was in the middle of -- Harvey
17 occurred in the middle of hurricane season, right?

18 A. It did, yes.

19 Q. And hurricane season in Texas spans from June
20 to November, correct?

21 A. That's my understanding, yes.

22 Q. Okay. And Harvey hit at the end of August?

23 A. Yes, it did, yes.

24 Q. Okay. Now, that hurricane that was forming
25 out in the Atlantic at the time of Harvey finally, you

1 know, at some point after that it got a name, correct?

2 A. I don't recall.

3 Q. Have you ever heard of Hurricane Irma?

4 A. I did, yes.

5 Q. And are you aware that that was forming in
6 the Atlantic at the time of the Harvey event?

7 A. In general. I don't recall the specifics of
8 looking at it.

9 Q. Okay. Mr. Bardol, when you developed your
10 opinions, you knew that the dams were drained prior to
11 a major storm hitting again, correct?

12 A. Can you ask that again? I just want to make
13 sure I --

14 Q. When you developed your opinions --

15 A. Yes.

16 Q. -- after the storm, you knew that the dams
17 were drained before another storm hit, correct?

18 A. Correct, yes.

19 Q. Okay. But when induced surcharges releases
20 began on August 28th, the corps didn't know whether a
21 future storm would hit the area or not, correct?

22 A. That's correct. But I don't know if that
23 going in and induced surcharges from when I looked at
24 other storms wasn't predicated on them following the
25 induced surcharge. It was based on elevation, rate of

1 rise. There wasn't a decision tree that I saw on
2 there -- if there's other storms, if it -- you know,
3 any other trigger points except for what's happening at
4 the reservoir at the time between the elevation and the
5 rate of rise.

6 Q. So let's get back to my question just to make
7 sure we've got a clean answer.

8 When the induced surcharge releases began on
9 August 28th, the corps did not know what future storms
10 might hit the area while there was water behind the
11 dam, correct?

12 A. I don't know what they knew or didn't. I
13 just know when they did the induced surcharge it was
14 based on elevation and rate of rise, so I don't know
15 what other information they had or how that -- what
16 went into their process. But just going after the
17 induced surcharge, it's the elevation and rate of rise.

18 Q. You noted just now that you don't know what
19 they knew or didn't know, correct?

20 A. Specifically for -- you're asking about
21 hurricane -- you know, the other hurricanes, what was
22 forecasting. I don't know what -- the information they
23 had at that time for other storm events.

24 Q. And you're saying that you did have
25 information about other aspects of the operation such

1 that you believe you did know what they knew?

2 A. Kind of a broad question. I'm just trying to
3 narrow it down.

4 What I am I guess providing opinion on is the
5 fact that they followed the Water Control Manual, they
6 used that, from what I've seen, and then the deposition
7 testimony, looking at the document, it was based on
8 what was happening at that time. They had a certain
9 elevation they hit, and then they had a certain rate of
10 rise, and that was the process that they went through
11 and enacted the Water Control Manual for the induced
12 surcharge.

13 Q. You're aware that it doesn't take a hurricane
14 to put significant water into the reservoirs, correct?

15 A. It doesn't -- a rain event.

16 Q. Right.

17 A. A significant rain event, yes.

18 Q. So the year before Harvey, the Tax Day Storm,
19 that was not a hurricane, correct?

20 A. Correct.

21 Q. And you don't know how the induced surcharge
22 regulations for these dams account for the possibility
23 of future storms, do you?

24 A. I did not see any documentation where that's
25 laid out.

1 Q. And so you don't have any answer, do you?

2 A. I didn't see any documentation on it, so,
3 yeah, I don't see how that's correlated, but I don't
4 know.

5 Q. Okay.

6 MS. DUNCAN: Your Honor, I am at a good
7 stopping point. I'm happy to keep going. What is your
8 preference?

9 THE COURT: I'd like to adjourn at least at
10 noon for about an hour and a half, so --

11 MS. DUNCAN: Okay.

12 THE COURT: -- maybe we can --

13 MS. DUNCAN: Keep going.

14 THE COURT: -- finish up the witness before
15 noon.

16 MS. DUNCAN: Well, we won't finish up before
17 noon, but we can -- I can get us to a good stopping
18 point by about noon.

19 THE COURT: Okay.

20 MS. DUNCAN: Okay.

21 BY MS. DUNCAN:

22 Q. Mr. Bardol, on Friday, I heard you opine that
23 the ordinary -- that the induced surcharge releases
24 were an ordinary operating procedure. Is that what you
25 stated?

1 A. I believe in so many words, yes.

2 Q. Okay. Now, you don't explain a method for
3 arriving at that opinion in your expert report, do you?

4 A. No, I mean at the time the "ordinary
5 operating," is -- it's a term that was used after.
6 There's the normal flood, then it's written down as far
7 as for the induced surcharge, what's written down as
8 being the standard process when you go through and look
9 at, you know, for the Water Control Manual. So there's
10 other emergency operations that would even deviate from
11 the Water Control Manual based on other elements but
12 this is a written procedure for the standing, you
13 know -- the standard guidance for the dam tender, so it
14 would be the normal, then it would be the induced
15 surcharge.

16 Q. So let's go back to your report.

17 Your report doesn't use the phrase "ordinary
18 operating procedure," correct?

19 A. It's nowhere in the -- in the -- in the
20 manuals, so I didn't use that term, no.

21 Q. Okay. And let's get to that next point.
22 "Ordinary operating procedure" is not a phrase used in
23 the Emergency Action Plan, correct?

24 A. No, that term is not. It has the normal
25 flood control induced surcharge but it doesn't use the

1 word "ordinary."

2 Q. And the word "ordinary operating procedure"
3 isn't used in the 1962 manual, is it?

4 A. I don't believe it is, no.

5 Q. And I think you just mentioned that it is
6 also not a phrase used in the 2012 manual, correct?

7 A. Correct. I was using it, you know, on Friday
8 just based on the definition that it is, that it's --
9 it's written in there but it's not -- I mean it's not
10 written in there, but just the induced surcharge is
11 written in there as being a standard process. So
12 there's a normal flood control operation and induced
13 surcharge.

14 Q. So I think I'm starting to understand what
15 you mean by ordinary operating procedure. You're
16 saying if it's written in the manual, it must be an
17 ordinary operating procedure. Is that your definition?

18 A. That's part of it, yes.

19 Q. If we go to JX 2 at PDF 49. Now, you just
20 mentioned the sort of two ways that the reservoir
21 operates, the two methods. You know that the first one
22 is 7-05(a) called "Normal Flood Control Regulation,"
23 correct?

24 A. Yes, that's what it says, correct.

25 Q. And then on the next page, 7-05(b), the other

1 way that the reservoirs operate is under "Induced
2 Surcharge Flood Control Regulation," correct?

3 A. Within this manual, yes, correct.

4 Q. Okay. And if we go back to 7-05(a), you'd
5 agree that normal conditions are defined to exist when
6 the reservoir's pools are not in the range of the
7 induced surcharge schedule, correct?

8 A. That is their definition, yes.

9 Q. And so normal flood control regulation is a
10 distinct regulation from induced surcharge regulation,
11 correct?

12 A. Correct, yes.

13 Q. And you're aware that the induced surcharge
14 regulation came in to effect during Harvey on
15 approximately August 28th, correct?

16 A. Correct, the morning of the 28th, yes.

17 Q. Okay. And so once the induced surcharge
18 regulation was in effect, normal conditions as defined
19 by the Water Control Manual no longer existed, correct?

20 A. It moved into the induced surcharge, correct.

21 Q. Okay. Now, once the -- if we move over to
22 7- -- the second page, 7-05(b), just to ask a few more
23 questions about induced surcharge.

24 Once the -- there are certain sort of
25 threshold elevations at which this regulation goes into

1 effect, correct?

2 A. Correct, yes.

3 Q. But that doesn't mean that the releases begin
4 at that time, right?

5 A. Correct.

6 Q. At that point, then, the corps starts
7 monitoring how quickly are the reservoirs rising,
8 correct?

9 A. Correct, yeah, as I said before it's based on
10 the elevation and then the rate of rise within the
11 reservoir.

12 Q. So it has to be a combination of those two
13 things, correct?

14 A. Correct, yes.

15 Q. And the corps doesn't control how much water
16 flows into those reservoirs, right?

17 A. That's correct.

18 Q. Okay. Now, you -- let's move to DX 105.

19 Now, you discussed the 1962 manual on Friday.
20 Do you remember that?

21 A. I do remember discussing it briefly.

22 Q. Okay.

23 MS. DUNCAN: And, Your Honor, I'll note for
24 the record that plaintiffs put this exhibit into the
25 record as PX 4. I think this version might be a little

1 clearer, so that's why I'm going to use this one. But
2 they should be the same document.

3 THE COURT: Mm-hmm.

4 BY MS. DUNCAN:

5 Q. Mr. Bardol, this 1962 manual, DX 105, was the
6 manual that was in place prior to the 2012 Water
7 Control Manual, correct?

8 A. That's my understanding, yes.

9 Q. If we go to PDF page 4, it shows the Table of
10 Contents. Now, if we move to the next page of the
11 Table of Contents, PDF 5, I'm going to show you what's
12 entitled "Section F."

13 You'd agree that Section F relates to
14 reservoir regulation procedures, correct?

15 A. Yes, correct.

16 Q. Okay. And if we go to PDF 6, Section H has
17 "Instructions to Dam Tender," correct?

18 A. That's correct, yes.

19 Q. Okay. Now, do you recall on Friday
20 referencing Section 30 of this report?

21 A. Briefly, yes.

22 Q. Yes. And you'd agree that paragraph 30 is
23 within the "Instructions to Dam Tender" section,
24 correct?

25 A. In the 1962 manual, yes.

1 Q. Okay. And if we -- let's talk just very
2 briefly about the reservoir regulation procedures in
3 Section F. Let's go to PDF 31. Okay. And that's
4 page 23 of the document. If we zoom in a little.

5 You'd agree that if we look to the center of
6 this paragraph, there's a sentence, "The regulation
7 schedules for operation of the Addicks and Barker
8 Reservoirs for flood control are shown in tables 9 and
9 10 and plates 14 and 15."

10 Correct?

11 A. Yes, that's what it says, yes.

12 Q. Let's go briefly to PDF 62. I'm going to
13 look at plate 14. Okay. And let's zoom in here and
14 let's also call out the bottom right box.

15 Mr. Bardol, you'd agree that plate 14 is
16 titled "Reservoir Regulation Schedule," correct?

17 A. Yes, that's correct.

18 Q. Okay. And if we move to PDF page 63, which
19 shows plate 15, you'd agree that this plate 15 is also
20 titled "Reservoir Regulation Schedule," correct?

21 A. Correct, yes.

22 Q. Okay. So now let's go over to page 40 where
23 we can look at paragraph 30 that you discussed on
24 Friday.

25 Now, you'd agree that in the center of the

1 page -- well, let's just start with the purpose of 30.
2 If we look at the first sentence, you'd agree that the
3 emergency regulation by dam tender is related to
4 circumstances where communication facilities between
5 the Addicks field office and the district fail during
6 the time of the flood, correct?

7 A. Correct, yes.

8 Q. And the plate mentioned down toward the
9 bottom half of the page are plates 22 and 23, correct?

10 A. Correct, yes.

11 Q. Okay. And if we go to PDF 69 which is plate
12 22, this is one of the ones that you walked us through.

13 MS. DUNCAN: Can we turn that? Great.

14 BY MS. DUNCAN:

15 Q. You talked to us about this on Friday, didn't
16 you?

17 A. Briefly on this one, yes.

18 Q. Okay. And if we look in the bottom
19 right-hand corner, this one is titled "Emergency
20 Operation Schedule," correct?

21 A. From the 1962 manual, yes.

22 Q. Okay. Now, on Friday --

23 MS. DUNCAN: And we can take that down.

24 BY MS. DUNCAN:

25 Q. Now, the 2012 Water Control Manual still

1 contains emergency instructions to dam tender, doesn't
2 it?

3 A. Can you ask that again, just to make sure I
4 heard that right?

5 Q. Well, you suggested that with paragraph 30
6 and the relating plate, that that was an emergency
7 schedule that was no longer in effect in 2012. But we
8 can agree that there is still an emergency operation
9 schedule for dam tenders in the 2012 Water Control
10 Manual, correct?

11 A. In the 2012, that plate is different. You
12 know, so it doesn't say "emergency" anymore. In the
13 2012, the only place where I see "emergency" is where
14 you talk about loss of communication. Underneath that,
15 that's the only time. But when it gets to the induced
16 surcharge, it does not use the word "emergency."

17 And from what I've seen, that goes back to
18 when there were improvements to the spillways in the
19 '80s. Well after the 1960s, they looked at the induced
20 surcharge, they're similar, but there's not the word
21 "emergency" when it looks to the actual flanking flows,
22 the uncontrolled. They updated the plates for induced
23 surcharge, but they don't use the term "emergency"
24 there.

25 Q. Now, Mr. Bardol, we looked at plates 14 and

1 15 in relation to the reservoir regulation procedures
2 and those did not contain the word "emergency,"
3 correct?

4 A. Correct, yeah, there's no word "emergency"
5 there.

6 Q. Right.

7 And so when it relates to the emergency
8 instructions for dam tender, the plates you're
9 referencing, 22 and 23 relate to that emergency
10 instruction to dam tender, correct?

11 A. Back when you go back to 1962, which was not
12 in effect at -- I just don't want to get the two
13 confused because there's similarities but there's a
14 distinct difference between the 2012 Water Control
15 Manual and then the reservoir regulation manual that
16 was back in 1962.

17 Q. Okay. Let's go briefly to JX 2 at PDF 10.
18 Actually, why don't we go to PDF 47 of JX 2. We're
19 going back to the 2012 manual.

20 A. Okay.

21 Q. The 2012 manual in Section 7-04 also has
22 instructions for the dam tender, correct?

23 A. Yeah, the standing instructions to the dam
24 tender, yes.

25 Q. Right.

1 And if we move to PDF 48, 7-04, section (b),
2 you'd agree that there is still a section for emergency
3 operations to the dam tender when communication between
4 the dam tender and the reservoir control are down,
5 correct?

6 A. When I read this, is only when communication
7 is down it goes to the procedures for the standing
8 operations, but this does not apply to -- in the
9 sequence of how this is presented in the Water Control
10 Manual is separate from the induced surcharge plates.

11 So this right here, the emergency operations,
12 it's -- how I read it here is -- it's -- it applies
13 when there's communication between the dam tender and
14 the reservoir control, you know, et cetera, as it reads
15 here, when there's loss of communication, how to
16 restore it, how to go through it. But that's not the
17 element that says, okay, now do induced surcharge.
18 There's a break between those two.

19 Q. You'd agree that both manuals contain
20 emergency operations for the dam tenders should
21 communications go down, correct?

22 A. They do have if communication goes down, that
23 there is procedures for that, yes.

24 MS. DUNCAN: Your Honor, I can keep going,
25 but I also am at a good stopping point. Would Your

1 Honor like me to keep going?

2 THE COURT: What's your prediction for lunch
3 then? How long?

4 MS. DUNCAN: Maybe until mid-afternoon, I
5 would estimate. It's going to take a little while.

6 THE COURT: Okay. I know I haven't gotten
7 much out of the cross that changes Mr. Bardol's
8 testimony. So, I mean, if you maybe focus -- if you
9 are challenging part of his testimony, focus on that.
10 But I'm not hearing any particular -- we're sort of
11 repeating his direct testimony, which I'm sure
12 plaintiffs don't object to having their direct
13 testimony reinforced. But I think the purpose
14 obviously of cross is to undercut his view or show
15 limitation on his giving an expert report, but I
16 haven't seen much of that. So I would hope we can
17 shorten it after lunch and focus it on points where you
18 think his testimony is not credible.

19 MS. DUNCAN: Sure. I mean, I could keep
20 going for another 15, 20 minutes if you would like to
21 keep --

22 THE COURT: Well, I promised the former chief
23 judge here who has been so nice to us that I'd come up
24 and have lunch there, so -- why don't we adjourn now.
25 We've got six minutes to 12:00. And we'll reconvene

1 at, let's say, 1:30.

2 We will stand in recess.

3 (Off the record from 11:54 until 1:30.)

4 THE COURT: We are back in session.

5 All right. You may proceed.

6 BY MS. DUNCAN:

7 Q. Okay. Mr. Bardol, do you recall on Friday
8 preparing a -- sort of describing a chart, DX 406?

9 A. Yes, I remember describing that. Yes.

10 Q. Okay. I have a copy of it right here just in
11 case. I don't want to mess up Mr. McGehee's Exhibit.

12 A. Okay.

13 Q. I'll just leave it up here. I want to ask
14 you a couple of questions about it.

15 A. Sure.

16 Q. Now, you testified that the capacity of the
17 reservoirs is the spillway design flood, right?

18 A. When you're looking at the -- comparing at
19 the spillway design flood, looking at that volume,
20 seeing that capacity, that volume up to that, yes,
21 that's the number I was looking at.

22 Q. And I heard you say that there was not an
23 emergency unless the water -- that would necessitate
24 releases unless the water reached this spillway design
25 flood level, correct? Is that your testimony?

1 A. Maybe just clarification on that. There
2 wasn't -- for dam safety concern, there wasn't a reason
3 that necessitate releases. There's the induced
4 surcharges at a much lower elevation that were followed
5 that released it. But as far as the dam safety
6 standpoint, that necessitated a release just at that
7 elevation.

8 Q. So there could be an emergency at the levels
9 indicated for the induced surcharge regulations,
10 correct?

11 A. There could be a stated emergency. There's
12 none that I saw, so they're open following the induced
13 surcharge, but just in and of itself reaching the 115
14 for the spillway design flood assuming the standard
15 flood, half of that, then coming in with the spillway
16 design flood that results in the 115, that in and of
17 itself is not an emergency at that elevation.

18 Q. Okay. Now, you didn't provide any mapping in
19 your report showing what the elevation of 115 would be
20 at the Addicks Reservoir, did you?

21 A. No, I didn't re-create a map at 115. I mean,
22 there's topography out there and the elevations are
23 published in the manuals.

24 Q. And you also didn't create a map at the
25 Barker Reservoir of the spillway design flood there at

1 108, correct?

2 A. No, I did not re-create a map showing that
3 elevation. That's already published as far as the --
4 the elevations are published.

5 Q. Okay. And you acknowledge, though, that
6 there would be water -- at those elevations, there
7 would be water going around the ends of the spillways,
8 correct?

9 A. There would be water going around the ends of
10 the spillway if you were looking at the spillway design
11 flood, yes.

12 Q. And you didn't quantify how much water would
13 be going around each spillway in your report, did you?

14 A. I'm relying on what's already published by
15 the Army Corps. So I didn't see the need to re-create
16 what was already published out there.

17 Q. And so you didn't state the amount of flow
18 that would be going around each of the spillways at the
19 spillway design flood in your report, right?

20 A. Not at the 115. It's already published in
21 the corps. I looked at -- as far as looking at the
22 much lower elevation, the 109 for the Hurricane Harvey,
23 then the 110, a little bit above 110 for the gates
24 closed, I looked at those elevations specifically.

25 Q. Okay.

1 MS. DUNCAN: I'd like to turn to DX 114.
2 Please look at the first page briefly. And, actually,
3 let's move to the second page. Third page, excuse me.
4 Page ending in 2964.

5 BY MS. DUNCAN:

6 Q. Now, Mr. Bardol, this is the 2023 Emergency
7 Action Plan for Addicks and Barker Reservoirs, correct?

8 A. It is, yes. Just the title page looked a
9 little bit different. Yes, it is.

10 Q. Okay. And are you aware that this Emergency
11 Action Plan does contain mapping showing the
12 approximate contours of the spillway design flood?

13 A. It does, yes.

14 Q. Okay. So let's just take a look at what that
15 looks like to provide context for what you say is not a
16 dam safety emergency.

17 MS. DUNCAN: Let's go to page 58. This is
18 PDF page 58.

19 BY MS. DUNCAN:

20 Q. Okay. Mr. Bardol, if we just look at the
21 bottom left-hand corner, let's talk about the -- the
22 very first time this notes that map shows the Addicks
23 Dam pool elevation at the time of the sort of breach
24 shown here is at 115. So I'm not too worried about the
25 breach scenario right now. I just want to ask you

1 about the elevation at the time of the breach, which is
2 115.1.

3 Now, you said that spillway design elevation
4 for Addicks is 115, correct?

5 A. The spillway elevation?

6 Q. The spillway design flood --

7 A. The spillway design flood --

8 Q. -- the elevation for that flood?

9 A. The spillway design flood is the 115.

10 Q. Right.

11 A. That's in the published in the table, yes.

12 Q. Okay. And then the paragraph just below that
13 notes that the maximum high pool scenario corresponds
14 to the maximum inflow design elevation, and that's what
15 you're talking about at 115 elevation?

16 A. Yes, yes.

17 Q. Okay. And if we look on the far right-hand
18 side, you can see in the legend there's a statement
19 that relates to the hashmarking, and that's the
20 inundation prior to breach, correct?

21 A. Yeah, I see the -- yes, yes.

22 Q. Okay. So let's take a look at the center of
23 the map.

24 MS. DUNCAN: And, Mr. Jackson, if you can
25 just zoom us in on really the hashmarks. That's what I

1 care about.

2 BY MS. DUNCAN:

3 Q. Now, Mr. Bardol, this is the inundation map
4 for the flooding that would occur at just below 115.1,
5 correct? That's how this map is to be read?

6 A. Correct. This is during the spillway design
7 flood, the scenario leading up to it with the standard
8 design flood and then on top of that you bring in the
9 spillway design flood, the other 44 inches, yes.

10 Q. And so when you talk about the fact that
11 there will be water going around the ends of the --
12 over and around the ends of the dams --

13 A. Yes.

14 Q. -- at elevation 115, this map up here shows
15 us in the hashing what would occur at Addicks Dam,
16 correct?

17 A. This shows it at the 115 for the full
18 spillway design flood for that scenario. I did the
19 mapping, I mean just to be clear, for the 110 that was
20 the gates closed which is, you know, 5 feet lower than
21 this. So I showed that mapping. But this is for if
22 Addicks, just looking at Addicks, was 5 feet higher
23 than the gates-closed scenario.

24 Q. Right. And you said this isn't an emergency.

25 MS. DUNCAN: Excuse me, Your Honor.

1 THE COURT: I just wanted to get clear what
2 we're looking at. This area is flooded here where the
3 hashmarks are?

4 MS. DUNCAN: Yes, that's the inundation prior
5 to -- excuse me, that's the inundation at 115
6 elevation.

7 THE COURT: Okay. So this is all at 115.
8 And so the water would have been coming out of the --
9 this area, the reservoir in through all these other --
10 whatever is there.

11 Is that correct?

12 THE WITNESS: Correct. It -- if it hits the
13 115 which was, you know, 5 plus feet higher than
14 Hurricane Harvey, or 6 feet, that's where it would go
15 for the 115 for the spillway design flood.

16 THE COURT: It came out of the spillways and
17 overflowed the dam?

18 THE WITNESS: This would just be activating
19 the auxiliary spillways to the north flowing around
20 there and then the other auxiliary spillways would be
21 activated as well.

22 THE COURT: This would be just from the
23 spill- -- the spillways?

24 THE WITNESS: Correct, the flanking flows
25 that would going around at the 115 elevation.

1 THE COURT: Okay. Thank you.

2 THE WITNESS: Yes.

3 BY MS. DUNCAN:

4 Q. So now let's move to PDF page 65. And I'd
5 like to walk you through the same exercise.

6 If you look in the bottom left-hand corner,
7 you'd agree that this maximum high pool scenario
8 corresponds to the maximum inflow design flood
9 elevation, correct, at Barker?

10 A. Yes, that's correct.

11 Q. Okay. And if we zoom in on the hash marked
12 areas, do you agree that this is where the flows will
13 go in the hashed area when the reservoir is at this
14 spillway design flood, correct?

15 A. Correct. If it goes up to the spillway
16 design flood, again, just want to make sure I'm clear,
17 it's much higher than what happened during Hurricane
18 Harvey. And then you also had mentioned as far as that
19 this wouldn't be an emergency, I had mentioned that
20 there's a distinction downstream, there's a distinction
21 between emergencies downstream flooding, emergency
22 response, but for the actual dam safety itself, it
23 going up to this elevation in of itself is not an
24 emergency. There's other procedures for inspecting the
25 dam and doing observations.

1 Q. So you said there would be a flooding
2 emergency downstream.

3 But what about the people that live in the
4 areas around the ends of the dams that will now be
5 flooded in a spillway design flood? Is that an
6 emergency?

7 A. Well, I'm just making a distinction between
8 the emergency for individuals that's being flooded,
9 just due to rain, downstream/upstream, and then the
10 distinction between a safety and emergency at the dam
11 itself that necessitated the release of the water. So
12 I'm making a distinction of where the emergency is
13 being looked at and where it's being applied.

14 Q. So we've looked at where the water would go
15 around the ends at the point before you say that there
16 is a dam safety emergency. So now let's talk about the
17 quantity of water.

18 MS. DUNCAN: We can take that down.

19 BY MS. DUNCAN:

20 Q. You're familiar with a rating curve, right?
21 The concept of a rating curve?

22 A. Yeah, a flow rating curve or -- is that --

23 Q. Sure?

24 A. Yeah, I mean there's a lot of rating curves,
25 yes, but I am.

1 Q. Sure.

2 And you're familiar with the concept of a
3 spillway rating curve?

4 A. Yes.

5 Q. Okay. And, for example, a spillway rating
6 curve for each of these emergency spillways would tell
7 you how much flow you could expect to be going over
8 them at a certain elevation; is that right?

9 A. That's correct, yes.

10 MS. DUNCAN: Let's go to DX 372.

11 BY MS. DUNCAN:

12 Q. Now, are you familiar with the spillway
13 rating curve for the Addicks north emergency spillway?

14 A. In the preparation of the report, I did look
15 at it back then, yes. It's been a while, so I'd have
16 to look at it again to...

17 Q. Okay. Great.

18 MS. DUNCAN: So why don't we look at DX 372,
19 and let's zoom in on the top.

20 BY MS. DUNCAN:

21 Q. And if we look at who this is from, this is
22 an email from Mr. Mike Kauffman, right?

23 A. That's what it says, yes.

24 Q. And you listed Mr. Kauffman and his
25 deposition as one of the items you relied on in your

1 report, right?

2 A. It was, yes.

3 Q. And he is sending this email to Mr. Maglio,
4 right?

5 A. That's what it says, yes.

6 Q. And you were here on Friday when he
7 testified, correct?

8 A. I was, yes.

9 Q. Okay. And so Mr. Kauffman is describing to
10 Mr. Maglio that there is a rating curve for the north
11 Addicks spillway, correct?

12 A. That's what this email says, yes.

13 Q. Okay. And at elevation 115 the spillway
14 design flood that you say is not a dam safety
15 emergency, you can expect 181,179 cubic feet per second
16 around the north end of Addicks, correct?

17 A. That's what this rating curve says, yes.

18 Q. And just to put that into context, the
19 maximum combined outflow during the Harvey event coming
20 downstream was just 13,800 cfs, correct?

21 A. Correct. And that goes back to corresponding
22 with what's in the reservoir which was close to the 109
23 which was closer to the 1,500 cfs for the flanking
24 flows.

25 Q. Now, you're aware that on August 28th of

1 2017, the forecast at Barker was that the elevation at
2 the reservoir would go to 112 feet, correct?

3 A. I do recall, yes.

4 Q. Okay. And at 112 feet, the corps could
5 expect 23,315 cfs around the north end of the Addicks
6 spillway, correct?

7 A. That's what that prior correspondence
8 discussed.

9 Q. Okay. And, you know, you'd agree that if
10 we're -- if the reservoirs are at their spillway design
11 floods, for example, at Addicks, if it's at spillway
12 design flood 115, there's not just water going around
13 the north end, is there? It's also going around the
14 south end, right?

15 A. When it reaches that elevation, yes.

16 Q. Okay.

17 MR. McGEHEE: Your Honor, we would make the
18 same objection. What was forecast, what huge amount of
19 water was forecast to be inflowed, what future storms
20 or tsunamis were forecast are irrelevant. The
21 important point here is what necessitated opening the
22 gates, so we object based on relevance.

23 THE COURT: Okay. I tend to think that some
24 of that is correct. I mean, it doesn't -- unless there
25 is a forecast which was made which the government

1 officials were relying upon whether there could have
2 been or might have been seems to be irrelevant.

3 MS. DUNCAN: So, Your Honor, we discussed
4 this morning DX 213 which is a compilation of corps
5 forecasts that the corps was using in developing as it
6 was operating the project during the storm. And you're
7 going to hear about those in more detail from
8 Mr. Thomas later today and Mr. Kauffman later this
9 week. So they were absolutely being used to help
10 understand how to operate. They weren't part of the --
11 well, you'll hear from Mr. Thomas in more detail.

12 But what -- I think the real key to the
13 relevance here is that it's at a hindsight inquiry, you
14 don't look at whether there was a necessity with
15 perfect knowledge years after the fact. You have to
16 look at what was known to the decision makers at that
17 time.

18 THE COURT: Well --

19 MR. McGEHEE: Your Honor, one last point if I
20 may, sir?

21 They stipulated that they followed the
22 manual. And if they followed the manual, none of this
23 stuff is relevant. So we have a stipulation before
24 trial that in order to open the gates they followed the
25 Water Control Manual.

1 MS. DUNCAN: May I, Your Honor?

2 THE COURT: Yes.

3 MS. DUNCAN: The reason we're talking about
4 this is because plaintiffs have claimed that the
5 capacity of the reservoir was this extremely, extremely
6 large amount of water. Capacity means what it can
7 contain. So they have put in the record this claim
8 that at the time the releases were made, the reservoir
9 was only at 66 percent of capacity which is not true.

10 THE COURT: Okay. Well, there's going to be
11 some witness who you're going to put on who is going to
12 say that, correct?

13 MS. DUNCAN: Your Honor, to be clear, we
14 agree that -- the United States agrees that the corps
15 did follow the Water Control Manual, but the point of
16 this sort of inquiry, I think, goes to the fact that
17 plaintiffs are claiming that we essentially should not
18 have followed the Water Control Manual, that the gates
19 should have stayed closed even though the Water Control
20 Manual said to leave them open. So we're talking about
21 some of this in the context of the reasonableness of
22 the decision to open.

23 THE COURT: I didn't think that was the
24 plaintiffs' position. Mr. McGehee maybe can enlighten.
25 I thought the position was because this was part of the

1 plan, the -- there's a taking, it was conscious
2 government action, the plan to flood it that --

3 MR. McGEHEE: That is precisely our point.

4 MS. DUNCAN: Well, yes. Then there's this
5 piece of this necessity defense where they're having to
6 essentially argue that it was not reasonable action in
7 the face of, you know, imminent danger and actual
8 emergency. And so they have been sort of attacking the
9 corps' decision to make releases and claiming it wasn't
10 reasonable. They've said, you know, the corps should
11 have waited until I think the dam was at capacity is
12 what they're saying. You wouldn't have a dam safety
13 emergency until then. So we're putting on evidence
14 that goes to that question.

15 THE COURT: I don't think that's what
16 Mr. McGehee was saying or what I've been hearing.

17 MR. McGEHEE: So the only reason under the
18 sun, the only -- no matter what tsunamis are coming
19 next, the only reason under the sun is because the
20 Water Control Manual says open the gates when you get
21 to this elevation and this rate of rise. That's the
22 only reason.

23 THE COURT: If that's the case, I don't see
24 what any of this -- what it is relevant to disproving
25 that. Does the government argue now that it released

1 them for some other reason other than the manual? I
2 thought the government --

3 MS. DUNCAN: You are going to hear that the
4 corps followed the Water Control Manual and as part of
5 that it was addressing ongoing dam safety concerns.
6 And, Your Honor, that's actually the next item on my
7 list to talk about.

8 Plaintiffs have claimed that these
9 spillway -- emergency spillways were safe and there was
10 no risk and that's absolutely not the case. So we're
11 going to have to cross-examine Mr. Bardol about that
12 and you'll hear about that more from a corps witness as
13 well.

14 THE COURT: Okay. Well, let's -- I mean, the
15 purpose of cross-examination is to test the credibility
16 of what the individual has said or the credibility of
17 the individual. Those are the two purposes. So please
18 focus on those, then.

19 MS. DUNCAN: Let's go to JX 13.

20 BY MS. DUNCAN:

21 Q. Now, Mr. Bardol, you're aware that at the
22 time of Hurricane Harvey the dams were rated Dam Safety
23 Action Classification I, correct?

24 A. That's correct, yes.

25 Q. Okay. Let's go to PDF 52 of this document.

1 And we're at page 3-2.

2 And just to be clear, you're familiar with
3 this document, right?

4 A. I am, yes.

5 Q. Yes. It's an engineering regulation relating
6 to safety of dams, correct?

7 A. There's many out there and this is one of
8 them, yes.

9 Q. And this is the one that controls the corps
10 operations at this dam, correct?

11 A. For this facility.

12 Q. Yes.

13 Okay. And so let's look at 3.2.4.1.

14 "Classification I (Very High Urgency).

15 Classification I is for those dams where progression
16 towards failure is confirmed to be taking place under
17 normal operations and the dam is almost concern to fail
18 under normal operations within a few years without
19 intervention; or the incremental risk, combination of
20 life or economic consequences with likelihood of
21 failure is very high. USACE considers this level of
22 life risk to be unacceptable except in extraordinary
23 circumstances."

24 Now, I read this paragraph correctly, right?

25 A. You did. Let me just read it again here.

1 Q. And I have a follow-up question for you.

2 A. Yes.

3 I mean, it says where the progression towards
4 failure is confirmed to be taking place.

5 Q. So I read it correctly, didn't I?

6 A. You did, yes.

7 MS. DUNCAN: Okay. And so let's go to JX 42.
8 That is the Dam Safety Modification report.

9 BY MS. DUNCAN:

10 Q. Now, you told me that this is an accurate
11 document, and you've already read from it in your
12 testimony, right?

13 A. As far as I know it's accurate. I did read
14 through it, yes.

15 Q. Okay. So let's turn to PDF 18. This is the
16 Executive Summary. And excuse me. Let's start at the
17 Executive Summary on 1.1. And if we look below the
18 note paragraph, it states that -- well, you'd agree
19 that the dams were rated DSAC I just before this report
20 came out; is that right? In the years prior to it?

21 A. That's what we read, yes.

22 Q. And the purpose of this study was to
23 "identify and recommend an alternative risk management
24 plan that supports the expeditious and cost effective
25 reduction of risk associated with the significant

1 failure modes that contributed to the DSAC I
2 classification of the Addicks and Barker dams,"
3 correct?

4 A. That's what it reads here.

5 Q. Okay. And you know --

6 MR. McGEHEE: Your Honor, objection.
7 Relevance.

8 THE COURT: Yeah, I'm not sure what the
9 relevance is.

10 MS. DUNCAN: Well, now we're going to talk
11 about the status of these spillways and the other
12 residual risk that existed at the time of Harvey.

13 THE COURT: Okay. You may proceed.

14 BY MS. DUNCAN:

15 Q. And, Mr. Bardol, the very first paragraph
16 notes that this is just phase 1 of a phase 2 study,
17 correct?

18 A. It does state that a phase 2 study will be
19 completed, that there was a phase 2, yes.

20 Q. Right. And that the phase 1 was focused on
21 the extremely high risk associated with seepage and
22 piping beneath, around, and near the conduits, correct?

23 A. Yes. And there was subsequent improvements
24 that were done to address those and other follow-on
25 improvements.

1 Q. Right. But there was never a full-scale
2 study to test those updates, was there?

3 A. There was -- I mean, there was a design and
4 implementation of improvements, and then there was
5 follow-on construction for it.

6 Q. And when we talk about conduits, we're
7 talking about the outlets right here where the water
8 comes out, correct?

9 A. Those are the outlets.

10 Q. And the corps thought that these outlets
11 posed such a problem that it decided that it needed to
12 construct entirely new outlets, correct?

13 A. Looking back from 1962, there was
14 improvements and then they looked at -- the follow-on
15 implementation to fix everything was to construct new
16 outlets. They had some modifications and improvements
17 for the existing outlets, but then just with this
18 being, you know, in place for 40, 50 years, there was a
19 design to do new outlets, yes.

20 Q. Right.

21 Because the outlets that were in place in
22 2013 were extremely high risk, correct?

23 A. Based on the investigation, there was -- they
24 did some implementation as far as maintenance, they did
25 ground injections, other things on that for the safety

1 of those. For the long-term they were going to do a
2 replacement. But then going back as far as the
3 performance, the memorandum after that was prepared
4 that looked at the observations during the storm, there
5 was nothing that was noted as being of concern during
6 the storm.

7 Q. So you're talking about the after-action
8 report, and we're going to talk about that briefly.

9 But my question for you is about the status
10 of the reservoirs at the time of Harvey, what was known
11 to the -- I want to talk about what was known sort of
12 at the time of Harvey.

13 And so a follow-up question here is, the
14 corps did not complete its replacement of the outlets
15 at these two outlet works, correct, at the time of
16 Harvey?

17 A. They did not complete the full replacement,
18 but they had done implementation prior to that as far
19 as ground injections to look at the immediate concern.
20 But then also as part of that, they did observations,
21 so the after-action report was written after, but that
22 would also include observations during the storm event.
23 So it has observation that was happening during the
24 actual storm event itself.

25 Q. Now, just while we're talking about that

1 after-action report, you would agree with me that
2 after-action report analyzed the project as they were
3 operated during the storm, correct?

4 A. It analyzed during -- real-time information
5 during the storm itself.

6 Q. And it analyzed the performance of the
7 structure including the use of the induced surcharge
8 releases, correct?

9 A. It looked at it during the Harvey storm and
10 said it performed as intended.

11 Q. And that report, that after-action report did
12 not analyze what would have occurred and what the
13 structural stability would have been at the dam if the
14 releases had not been made, correct?

15 A. It looked at the conditions during Harvey
16 going up to the 109, not up to 110. But it looked at
17 the 109 and then it had the observations during the
18 storm event.

19 Q. And so it did not look at an alternative
20 scenario where the gates stayed closed, correct?

21 A. It didn't look at alternatives. It just
22 looked at observations during the storm event.

23 Q. Okay. So now let's talk about another risk
24 factor in this report. Let go to PDF -- well, just one
25 second.

1 Okay. So we're going to turn to page 1-4 of
2 JX 42, and we're going to look right in the middle of
3 the page, PFM 5.

4 Mr. Bardol, PFM stands for probable failure
5 mode, right?

6 A. It does stand for be probable failure mode.

7 Q. Now, this is one of the probable failure
8 modes that was found to be -- determined to be
9 significant failure mode for both Addicks and Barker
10 Dams, correct?

11 A. What I just put in context, I mean, when you
12 look at -- when I go through looking at potential
13 failure modes for a dam or some type of flood control
14 facility, you look at a wide range of all potential
15 probable, you know, so it's -- you know, it can really
16 cover almost anything, you know, earthquakes, you know,
17 thousands-plus-year storm events. You look at every
18 potential area so you're looking at all of the
19 different analysis. So this is looking at one extreme
20 event of what could happen, but then also in the back
21 it goes to just the potential probable failure mode
22 that gets looked at the analysis but then it also goes
23 into the statistical probability of any of these
24 happening which I think for this one I think it's back
25 in that -- I don't remember offhand, it's a very low

1 probability.

2 So you go through all these potential failure
3 modes and it looked at what it could cause and then you
4 look at the risk of that failure but then you also look
5 at the probability of that as well.

6 Q. Okay. And so you're saying that the PFM 5 is
7 a very low risk of failure?

8 A. Yes. I don't remember it offhand, but it's
9 like in the order of like 1 or 2 in 1 million or
10 something like that. But there's an exact table in the
11 back.

12 Q. And at the spillway design flood capacity
13 that you say is the capacity at which there's only then
14 a dam safety emergency, do you know what the
15 probability of failure is for PFM 5?

16 A. It's in the back. I don't remember it
17 offhand, but it goes to the -- what could happen, it
18 just looks at everything and then it looks at the
19 probability of it happening and there's a chart I
20 believe there's like a graph or something at the back.
21 It's probably like 1 or 2 in a million, so it's -- it's
22 very low probability of it happening.

23 Q. It's a very low probability at the spillway
24 design flood; is that what you're saying?

25 A. Yes. It's back. You know, instead of going

1 off memory if we could maybe go to that page?

2 Q. Sure.

3 A. There's one for this and other ones that go
4 in there.

5 Q. We'll go there in just one moment.

6 So to explain what this PFM 5 is. Let me
7 bring a couple of posters over here. And these are
8 excerpts of DX 637. And what I'm going to do is I'm
9 going to put this down.

10 Now, I'm going to show you first -- I believe
11 that this is the third page of DX 637.

12 Do you see that we are looking at the north
13 side, a picture of the north emergency spillway?

14 A. I'll call it the auxiliary. I think the
15 updated manuals called it the auxiliary, but it's the
16 spillway to the north, yes.

17 Q. Okay.

18 And then on the south here we've got the
19 south emergency spillway; is that right?

20 A. That is the south spillway.

21 Q. Now, you told us that these were covered in
22 concrete in the 1980s and that they remained safe to
23 pass the spillway design flood, correct, at the time of
24 Harvey?

25 A. I said that they were designed to pass it,

1 and then subsequent there's operation maintenance for
2 the corps to maintain those. As far as -- I didn't go
3 through maintenance records, but it was designed for it
4 and then they had operational maintenance to be able to
5 maintain those spillways.

6 Q. Okay. And so this is I think the last PDF 5
7 of DX 637, and just to give the court a sense of what
8 you mean by "concrete," these are pictures of the
9 spillways with the concrete on them, correct?

10 A. That is correct, those are the spillways with
11 concrete.

12 Q. Okay.

13 MS. DUNCAN: So let's go back now to JX 42,
14 page 1-4.

15 BY MS. DUNCAN:

16 Q. Okay. So when it says "Loss of all auxiliary
17 spillways RCC slabs and breach of auxiliary spillway at
18 high pools," that's a probable failure mode 5, correct?
19 That's what this refers to?

20 A. This is looking at that possibility of what
21 would happen. Again, these probable failure modes are
22 not -- when you write these, you're not first looking
23 at the statistical probability of it happening. You're
24 looking at every potential mode of failure. Then you
25 go through the analysis of what that risk is and then

1 you go through the likelihood of that happening. So by
2 it being on the list, that doesn't mean that it's a
3 high probability. You're just looking at it as an
4 engineer of all potential ways that it could
5 potentially fail.

6 Q. Okay. And when it talks about the
7 roller-compacted concrete slabs potentially being
8 displaced, it's talking about sort of slabs of this
9 concrete, correct?

10 A. Correct. It's looking at those uplifting,
11 moving and then the earth underneath eroding. So it
12 would have been similar to back what would have been
13 1962 before these things were improved and be able to
14 have a higher capacity that could pass safely.

15 MS. DUNCAN: Let's go to PDF 198 of this
16 document.

17 BY MS. DUNCAN:

18 Q. Okay. This is JX 42, and this is page 3-34.

19 Now, this is the Probable Failure Mode 5,
20 System Response Curve, correct?

21 A. Yes, it is.

22 Q. Okay.

23 MS. DUNCAN: And if we zoom in on the chart
24 at the bottom of this page, let's go to the chart --
25 I'm sorry, the graph, excuse me.

1 THE COURT: We're going to take a short
2 pause.

3 MS. DUNCAN: Sure.

4 THE COURT: I've got a call from a security
5 company --

6 MS. DUNCAN: Oh, sure.

7 THE COURT: -- that the marshals put in to
8 see that there is no real emergency in my home.

9 I think they're probably not in violent need
10 of me, so, yeah.

11 MS. DUNCAN: May we proceed or --

12 THE COURT: Anything goes wrong, they
13 electronically call you to say something terrible is
14 happening. Or you call them and they're not ever
15 there, so it sort of balances. Anyway, they more annoy
16 you and when you need them, they don't respond, so
17 we'll leave that for later.

18 Proceed.

19 MS. DUNCAN: Okay.

20 THE COURT: I'm sorry to interrupt.

21 MS. DUNCAN: That's okay.

22 BY MS. DUNCAN:

23 Q. Now, figure 3-13 shows that at elevation 115
24 which you've said is the first time that you can reach
25 a dam safety emergency level pool that the probability

1 or Probable Failure Mode 5 is approximately 14 percent,
2 correct?

3 A. If you could go up to the table. I just want
4 to make sure you show the full page.

5 Q. Okay.

6 MS. DUNCAN: Can we include the table?

7 BY MS. DUNCAN:

8 Q. You can read this table, right?

9 A. Yes, I can.

10 Yeah, I mean, from here, just going back up
11 to 111.6, is zero, that they have on here, then they
12 have the system response and then they have probability
13 with intervention if they're doing anything else, and
14 then that would be -- yeah, that would be the bottom,
15 the correspondence. I just want to make sure I have
16 the decimal places correct here.

17 Q. Okay. So now going back to then the graph.

18 So you would agree that at elevation 115 the
19 probability of failure under PFM 5 is approximately
20 14 percent, correct?

21 A. If it got up to that elevation. But then
22 there's also all of the other emergency response that's
23 going at the time as far as observing the dam itself,
24 observing the condition out there specifically, you
25 know, so this graph would be looking at --

1 independently itself would be looking at observations.

2 Q. Okay. Now, you know that dam safety
3 modification reports also quantify sort of the lives at
4 risk from various failure modes, correct?

5 A. Yes, they look at impacts downstream.

6 Q. Okay. And let's turn to -- well, upstream?
7 I mean, you'd agree that they look at lives more
8 generally than upstream, correct?

9 A. I guess I kind of got your question mixed
10 around there. I mean they're looking at -- for dam
11 failure mode, they're looking at the impact downstream.

12 Q. They're looking at the impact of the -- on
13 life loss of the particular failure, correct?

14 A. Of a failure that's -- the water usually goes
15 downstream. So they would be looking at the inundation
16 downstream of the dam post failure.

17 Q. So they'd be looking at sort of impact to
18 lives of the inundation and the sort of type of failure
19 they are analyzing, right?

20 A. They do look at a breach now, yes, for
21 downstream, both lives lost, look at property
22 failure -- or property damage, so they're looking at
23 that extreme event, yes.

24 Q. And they also look at non-breach scenarios,
25 don't they?

1 A. They look at non-breach.

2 MS. DUNCAN: Let's go to page 2-80.

3 BY MS. DUNCAN:

4 Q. Now, we're still at Probable Failure Mode 5.
5 That's the uplift pressure of these emergency spillway
6 slabs coming off.

7 So if we look at the very top here, I want to
8 talk through probable -- excuse me, Probable Failure
9 Mode 5 as well as nonfailure. So let's start at 3-25.
10 This is titled "Addicks Dam Population at Risk by Pool
11 Level," correct?

12 A. That's the title.

13 Q. Okay. And it lists on the left-hand axis
14 various pool levels that were analyzed, correct?

15 A. They do on the left, yes.

16 Q. Right.

17 And then it lists the number of lives at risk
18 by each scenario, correct?

19 A. They do list the lives.

20 Q. And they provide a day total and a night
21 total, correct?

22 A. For each corresponding elevation.

23 Q. Okay. And so why don't we just start at 115
24 which you say is the pool level at which you first have
25 a dam safety emergency. And I want to start just by

1 looking at the very far two right columns, nonfailure.

2 Now, what that means is that the dam simply
3 doesn't fail, just it is handling a pool of 115
4 elevation, correct?

5 A. Well, a little bit of clarification of how
6 you classified what I said. There's a difference
7 between the emergency of a dam failure, so I didn't say
8 like everything up to a 115 that's the first time it
9 could fail. It's a gradual increase but as far as in
10 of itself being at a 115 up until that, I mean, at 112,
11 there's -- it's zero underneath that on the left. So
12 looking at the elevation going up there, you do take
13 into account observations, you're looking at what's
14 going on with the dam itself. Then when you talk about
15 the emergency of the dam safety, you're looking at
16 what's going on out there during the actual storm event
17 and the incident and taking in an observation.

18 Q. Okay. So, Mr. Bardol, let's talk about --
19 you'd agree that under a nonfailure mode, there are
20 numbers of lives listed for both elevations 115 and
21 112, correct?

22 A. For the nonfailure, it does list numbers
23 there.

24 Q. And for the nonfailure, the number of lives
25 at risk is 1,036,122, correct, and that's at night?

1 A. That's what it lists here for a 115 at night.

2 Q. Okay. And we already talked about how on
3 August 28th the Addicks Reservoir was forecast to be at
4 112 elevation, correct? That was going to be the peak?

5 A. From that previous report, it did mention a
6 112.

7 Q. Right.

8 And you'd agree that at pool elevation 112 at
9 Addicks for nonfailure at nighttime you got 645,949
10 lives at risk at night, correct?

11 A. What was the number again? The 760-?

12 Q. 645,949 lives at risk at night?

13 A. At night.

14 But I mean, this is outside of -- yes, at
15 night, if it gets up to 112. But that's outside of
16 operating, you know -- yes.

17 Q. Okay. And during the day at 112 elevation at
18 Addicks, even in a nonfailure situation, the number of
19 lives at risk are 516,782, correct?

20 A. Yes, just going back before I lose my train
21 of thought, going back to the 112, by having the
22 nonfailure lives lost, a massive flood, not diminishing
23 that, but that doesn't cause a dam safety concern of
24 the dam actually failing by it getting up to it. This
25 is acknowledging if you have that extreme of a storm

1 event that much flooding it can have lives lost. And
2 you use that to compare back to if there is a dam
3 failure at that elevation is there a difference between
4 just the flooding event itself with a dam failure or
5 without you look at what's that risk of the actual dam
6 failure at that elevation so are there more lives lost
7 if there's a failure versus lives lost in an extreme
8 storm event just due to the dam actually working,
9 functioning properly not having a dam safety issue and
10 it stays intact.

11 THE COURT: So let me maybe get this clear in
12 my mind because this is one of those important areas.
13 If the dam got to -- or if the level got to 112 which
14 was what was predicted at that time, was 112 what was
15 predicted?

16 THE WITNESS: From that earlier report, it
17 was predicted potentially to get up to 112.

18 THE COURT: So at 112, what did those numbers
19 mean, that they would -- and they're not the dam would
20 have failed at 112, but the water release would have
21 flooded that many people?

22 THE WITNESS: At the 112 on this table right
23 here, if you look at the night scenario, we'll just use
24 that since we've been talking about that mostly, at the
25 112, without a failure, the dam working perfectly,

1 those flows that are flanking could potentially have a
2 loss of life, they go through these multiple tables and
3 come up with this number that's the 649,000.

4 THE COURT: That doesn't necessarily mean
5 loss of life but it means people would be flooded
6 running around in the flood?

7 THE WITNESS: I'd have to look at the
8 narrative behind this of what that exact number is, if
9 it's potential for loss of life impacted. I'd have to
10 see the -- up that. But then where that number comes
11 in underneath the next one over for the right
12 embankment failure for this PFM 5 which is this
13 roller-compacted concrete doing the uplift, they look
14 at the potential lives lost. Underneath, comparing
15 those two, it is more but it's looking at that relative
16 cause so you might end up having you know zero for
17 nonfailure. I've looked at some where you have zero
18 and then it only has loss of life when you have a
19 failure so there's that higher risk and impact of that,
20 you know, performing badly of it failing.

21 Underneath here there's still an extreme
22 flooding event so there's potential for a lot of lives
23 lost even when the dam -- if the dam operates perfectly
24 as designed.

25 THE COURT: Right. Now, is there a

1 difference here in those numbers between opening the
2 gate and closing the gate or is it only a difference of
3 where the flood is?

4 THE WITNESS: I'd have look at the specifics
5 underneath this. This is looking at just the elevation
6 of the 112. And this from here is looking at -- again,
7 I'd have to look at the backup, I think this is dealing
8 with just the uncontrolled flanking flows of that over
9 there.

10 THE COURT: So just, again, this doesn't give
11 you how this option is -- how the numbers are changed
12 by opening the gates or closing the gates?

13 THE WITNESS: This table right here in of
14 itself, no, it does not.

15 THE COURT: Okay. Thank you.

16 MR. McGEHEE: Judge, just as a matter of
17 time.

18 THE COURT: Yeah.

19 MR. McGEHEE: Because forecast is not part of
20 the Water Control Manual, forecast had nothing to do
21 with the decision to open the gates, we object based on
22 relevance.

23 THE COURT: Okay. Thank you.

24 MS. DUNCAN: Would you like me to respond?

25 THE COURT: If you want to. You don't need

1 to.

2 MS. DUNCAN: Okay.

3 THE COURT: We don't force anyone to do
4 anything here.

5 MS. DUNCAN: We certainly do believe it is
6 relevant, Your Honor, because it is a type of
7 information that the corps was dealing with when it was
8 deciding whether and how to follow the Water Control
9 Manual and dam safety was top of mind and you're going
10 to hear more about that later. But you're going to
11 hear about the competing dam safety issues at the gates
12 which are right down here --

13 THE COURT: Okay.

14 MS. DUNCAN: -- and at the auxiliary
15 spillways as described as PFM 5.

16 THE COURT: Okay. Well, let's move on with
17 this witness so we can hear the other witnesses.

18 MS. DUNCAN: Okay.

19 THE COURT: We've heard him a lot.

20 BY MS. DUNCAN:

21 Q. Okay. So let's talk -- now, Mr. Bardol, you
22 did not model the likelihood of dam failure under a
23 gates-closed scenario, correct?

24 A. For the gates closed, I did not look at
25 probability.

1 Q. Okay. Probability of failure of the dam,
2 correct?

3 A. I did not look at probability of failure.

4 Q. Okay. But do you claim there was no
5 emergency at -- no dam safety emergency; is that
6 correct?

7 A. By looking at the information and looking at
8 the hydrologics of what it was designed to handle and
9 then the report of what was being observed, there
10 wasn't a declaration of emergency for dam safety that
11 necessitated the reason for opening the gates.

12 Q. Now, you'd agree that the Emergency Action
13 Plan doesn't contain a definition of the phrase or
14 doesn't even contain the phrase "formal declaration,"
15 correct?

16 A. It has underneath there. I need to look at
17 it, I believe it goes back to the dam safety officer.
18 But there's a very specific process that has an
19 individual that would declare an emergency. They look
20 at the information as guidelines. They look at the
21 information, look at observation, and then they have
22 the authority to declare an emergency based on their
23 observations, their understanding, and go through it.
24 So it has the definition -- or the term "declaring an
25 emergency."

1 THE COURT: But it was not -- it did not
2 occur in this case?

3 THE WITNESS: From what I've seen, I did not
4 see a declaration of emergency in what I've seen.

5 THE COURT: Okay. Thank you.

6 BY MS. DUNCAN:

7 Q. Okay. And so let's just touch on that
8 briefly.

9 MS. DUNCAN: Let's put up JX 1.

10 BY MS. DUNCAN:

11 Q. Now, you said you haven't seen a declaration
12 of emergency, and I just want to put this up in front
13 of you and note that, Mr. Bardol, this document has the
14 subject "Declaration of Emergency: August 2017
15 Tropical Event Harvey Galveston District," correct? I
16 read that correctly?

17 A. That's what the subject says.

18 Q. Okay. And date of this is August 22nd, 2017,
19 correct?

20 A. That's correct.

21 Q. Okay. Now, let's go to your report, PX 14 at
22 PDF 21.

23 MS. DUNCAN: Now, can we put the page before
24 right next to it.

25

1 BY MS. DUNCAN:

2 Q. Now, here you'd agree that this section, 2.6,
3 this is contained in the "Background" section of your
4 report, right?

5 A. It says the background and then also facts
6 and then I use that to draw a summary of conclusions
7 based on what was my understanding as being undisputed
8 facts going into it that there was not an emergency,
9 that this other information was out there and I give
10 my, you know, conclusion from that.

11 Q. And you cite a portion of Mr. Thomas'
12 deposition, correct?

13 A. Yes, I do.

14 Q. Okay. And you cite the portion where you say
15 he acknowledges there is not a formal declaration of a
16 level 1, 2, or 3 emergency, correct?

17 A. I do reference that.

18 Q. Now, you read his whole deposition, right?

19 A. A while back I did read it, yes.

20 Q. Okay.

21 MS. DUNCAN: So let's go to PX 47. And if we
22 go to PDF -- just one second.

23 Okay. Let's go to PDF 10.

24 BY MS. DUNCAN:

25 Q. Now, in the bottom left-hand corner,

1 Mr. Bardol, is the portion of the deposition that you
2 cited, correct?

3 A. Let's see.

4 That is correct, yes.

5 Q. Okay.

6 MS. DUNCAN: But now let's go to PDF page 9
7 and transcript page 271. And I want to zoom in on
8 page 271, and I want to read for you.

9 BY MS. DUNCAN:

10 Q. Line 19, the question is:

11 "So for purposes of the Emergency Action Plan
12 during Harvey, was there a state of emergency?"

13 I read that question correctly, right?

14 A. You did.

15 Q. And the answer on line 22 by Mr. Thomas is:

16 "We reached Emergency Level 2, sir."

17 Correct? I read that correctly?

18 A. You read that, yes.

19 Q. Okay.

20 MS. DUNCAN: And now let's turn to transcript
21 page 272. And let's zoom in on the center of that
22 page.

23 BY MS. DUNCAN:

24 Q. And Mr. Thomas was asked the question at line
25 11:

1 "Why was Emergency Level 2 called?"

2 I read that correctly, didn't I?

3 A. You did.

4 Q. Okay. And he answered starting at line 12,
5 he answered:

6 "Because there were going to be uncontrolled
7 releases as well as surcharge releases, which meets the
8 definition of expected flooding from uncontrolled or
9 controlled releases or potential dam failure."

10 I read that correctly, didn't I?

11 A. You did.

12 Q. And you didn't cite these portions in your
13 report, correct?

14 A. No, I did not.

15 Q. Now, before this case, did you ever read the
16 Emergency Action Plan for this project?

17 A. For Addicks and Barker, I did not read that.

18 Q. Okay. So let's go to JX 3 at 10.

19 You did read it as part of your work in this
20 case, right?

21 A. As part of this, I read it.

22 Q. Okay.

23 MS. DUNCAN: Let's zoom in on the top
24 portion, Section A.

25

1 BY MS. DUNCAN:

2 Q. Now, this Emergency Action Plan identifies
3 two types of emergency situations in this first
4 paragraph; is that right?

5 A. I'd have to reread it, but it does go through
6 it. It says it's twofold.

7 Q. And the first type of emergency situation is
8 related to preventing dam failure, correct?

9 A. To prevent dam failure.

10 Q. Yeah. So why don't we just read it. The
11 first situation outlined by the Emergency Action Plan
12 states "First, to identify emergency situations that
13 can threaten the Addicks and Barker Dam, and to plan
14 for an expedited, effective response to prevent failure
15 of a dam."

16 Correct?

17 A. That's how it reads, yes.

18 Q. And the second type of emergency situation
19 outlined by this Emergency Action Plan is to "Identify
20 emergency situations that could arise from normal
21 project operations such as reservoir pools greater than
22 the limits of government-owned land and uncontrolled
23 spillway releases, and to plan for a coordinated
24 response with local jurisdictions."

25 I read that correctly, right?

1 A. Correct, it could arise from those
2 situations.

3 Q. Okay. And in the next sentence, the
4 following paragraph, it identifies early signs of
5 potentially dangerous conditions and defines subsequent
6 actions, correct?

7 A. It does, yes, that's how it is read.

8 Q. Okay. Now, those emergencies are identified
9 later -- those emergency conditions are identified
10 later in the Emergency Action Plan, right?

11 A. They are --

12 Q. Okay.

13 A. -- as guidelines and then there's a few other
14 elements in here that talks about how they could be
15 used to inform decision-making.

16 Q. Okay.

17 MS. DUNCAN: So if we go to JX 3 at PDF 63,
18 this is Appendix C.

19 BY MS. DUNCAN:

20 Q. I just want to direct your attention to a
21 couple of things in here. If we -- you'd agree that
22 this is titled "Emergency Identification/Response
23 Matrix," right?

24 A. That's the title.

25 Q. Okay. And the far left column says --

1 relates to the "General Observation" that is being
2 identified, correct?

3 A. That's the title, yes.

4 Q. Okay. And this first portion of the table,
5 the general observation is rapidly rising reservoir,
6 correct?

7 A. Yes.

8 Q. Okay. Now, let's just focus in on the bottom
9 row down here.

10 MS. DUNCAN: If we can focus on that.

11 BY MS. DUNCAN:

12 Q. And there's a specific observation when it
13 relates to rapidly rising reservoir that's defined "As
14 reservoir level exceeds, or is projected to exceed the
15 limits of government-owned land 103 NAVD 88 for Addicks
16 Reservoir or 95 NAVD for Barker Reservoirs."

17 I read that correctly, didn't I?

18 A. You did.

19 Q. Okay. And this emergency identification
20 matrix says that this condition is called "Emergency
21 Level 2 Expected Flooding," correct?

22 A. That's the title there, yes.

23 Q. Okay. And the action that's required to
24 occur is to notify state and local emergency management
25 officials of emergency situations so they can take

1 action to protect lives and property in areas upstream
2 which will be flooded by increased reservoir levels,
3 correct?

4 A. Correct. It has nothing to do with the dam
5 itself, but it's looking at upstream/downstream
6 properties or individuals off the government-owned
7 properties.

8 Q. And so pool levels exceeding the
9 government-owned land has nothing to do with the dam
10 itself. Is that your testimony?

11 A. No. That's misclassifying it. You are
12 talking about the dam safety. It exceeding the
13 government-owned land doesn't necessitate as far as a
14 safety of the dam itself.

15 Is there flooding on others? Yes. But as
16 far as the safety of the dam itself, that structure is
17 really independent of that.

18 And then just to note on these observations
19 right here which is Appendix C, going back to the
20 original part you did, the intro, there's I think
21 underneath Section 2, 4, and 5 talks about
22 implementation that these right here are used as
23 guidance and then recommended action. They're not
24 mandatory. So going back underneath that initial, I've
25 got the individual position there of the dam safety

1 officer uses this as a guide and these are recommended
2 and they use that in advising what type of
3 implementation that would go in so that's back in
4 Section 2, 4, and then also 5 --

5 Q. And so you --

6 A. -- in the first part.

7 Q. Okay. So you'd agree that according to the
8 Emergency Action Plan, the expected flooding that is
9 predicted or does exceed government-owned land is
10 Emergency Level 2 under this plan?

11 A. Again, I would go back because it is a little
12 vague here because it has this as being the condition.
13 But when you go back and read that, the first part and
14 you have Section 2, Section 4, and Section 5, if we
15 could go back to so I don't have to go off of memory,
16 it does call these as being guidelines, and as far as
17 recommended actions and that it has the dam safety
18 officer going there and take what action they think is
19 appropriate.

20 MS. DUNCAN: And let's go to the next page.
21 Let's talk about one more condition. Okay? Let's
22 focus on the top part of this chart. Okay?

23 BY MS. DUNCAN:

24 Q. The general observation is "Flow around the
25 ends of the dams."

1 Okay? Did I read that correctly?

2 A. Yes.

3 Q. The specific observation, let's talk about
4 the very first one is "Reservoir levels are predicted
5 to rise to or at the point that water begins to flow
6 around the RCC spillways at the ends of the dam."

7 Now, I read that correctly, didn't I?

8 A. You did read that, yes.

9 Q. And these up here at 637, PDF 5, that's an
10 example of the roller-compacted spillways, right?

11 A. Yes, that is.

12 Q. Okay. And the Emergency Action Plan
13 Appendix C describes that specific observation as
14 "Condition Emergency Level 2 for uncontrolled
15 releases," correct?

16 A. That's what it says underneath condition,
17 yes.

18 Q. And the action that's required is to notify
19 the state and local emergency management officials of
20 this emergency situation so they can take action; is
21 that right?

22 A. Yes. You notify the local so that way they
23 can look at the offsite outside of the government-owned
24 property and then the last part is to monitor the
25 spillway for erosion displacement which the

1 observations didn't, you know, identify any.

2 And, again, this goes back underneath the
3 very first part, Section 2, Section 4, and 5 for the
4 implementation where these are guidelines for
5 recommended actions for then the dam safety officer and
6 the other team to be able to take an advisement for
7 what they think would be implemented.

8 MS. DUNCAN: So let's go back to Section E,
9 and that's at PDF 11. And let's zoom in on paragraph
10 E, Section E. Okay. And I want to just focus on the
11 second sentence of Section E.

12 BY MS. DUNCAN:

13 Q. You'd agree that this states that "The
14 procedures prescribed herein become automatically
15 effective when actual or predicted water surface
16 elevations within the reservoirs reach designated
17 limits or when the southwestern division" -- excuse
18 me -- "the Galveston dam safety officer declares an
19 emergency condition."

20 Is that right?

21 A. That's how that reads. And then the
22 follow-on sentence it says "The extent to which the DSO
23 activates the emergency levels," and it goes on,
24 depends the conditions at Addicks and Barker on
25 flooding and Buffalo Bayou downstream of the reservoir.

1 So it extends on to give as I see here some
2 flexibility. This is Section 2 I believe it was or 3.
3 But then there's also Section 4 and 5 that talks about
4 those very specific elements within Appendix C that we
5 saw as far as those tables. It goes into how those are
6 guidelines and recommended actions, and the DSO that's
7 mentioned here takes that and then they deem what needs
8 to be implemented.

9 Q. And the DSO at the time of Harvey was Mr. Rob
10 Thomas, correct?

11 A. I believe it was, yes.

12 Q. Mr. Bardol, you've never operated a dam,
13 correct?

14 A. I have not.

15 Q. Okay. You've never drafted an induced
16 surcharge regulation for the corps, correct?

17 A. I have not drafted for the corps but I design
18 dams, design spillways, I've designed the hydraulic
19 components for large facilities.

20 Q. Okay. And you've never had to apply an
21 induced surcharge schedule at a dam; is that correct?

22 A. I have not operated as a dam tender.

23 Q. And you certainly didn't help write the
24 Emergency Action Plan that applied to Addicks and
25 Barker?

1 A. For this, no, I did not help write this one.

2 Q. Okay. I want to talk briefly about your
3 modeling.

4 Now, you prepared two scenarios with your
5 models; is that right?

6 A. That is correct, yes.

7 Q. You prepared what we'll call an actual
8 scenario that tries to model what actually happened
9 during the Hurricane Harvey event, correct?

10 A. Correct. We simulated Hurricane Harvey, yes.

11 Q. Okay. And you did that for the downstream
12 properties, correct?

13 A. It focused on the downstream properties. The
14 reservoirs itself and then the downstream, yes.

15 Q. Okay. And then you also did a 2D model of
16 the reservoirs to understand the actual pools and how
17 much flanking flow went around, correct?

18 A. That is correct, we modeled the reservoirs.

19 Q. Okay. And then you did one other scenario
20 where you modeled the project as if the gates had been
21 closed pursuant Water Control Manual on the 25th and
22 then they stayed closed for the remainder of the event,
23 correct?

24 A. Correct, we did model that, yes.

25 Q. And you did that for the downstream area and

1 the upstream area, correct?

2 A. Correct.

3 Q. Okay.

4 MS. DUNCAN: I'm going to put this map back
5 up.

6 BY MS. DUNCAN:

7 Q. Now, Mr. Bardol, you didn't do a scenario,
8 for example, where you modeled what would have happened
9 if the corps had disregarded the Water Control Manual
10 for the entirety of the event and left the gates open
11 the whole time, correct?

12 A. We did not look at an alternative such as
13 that.

14 Q. And you also didn't look at an alternative as
15 if the projects had never been built, correct?

16 A. No, I mean that would be unrealistic if the
17 projects weren't built and everything else was there as
18 is, so we did not look at that.

19 Q. Okay.

20 MS. DUNCAN: I'd like to put up on the screen
21 JX 171.

22 BY MS. DUNCAN:

23 Q. Now, this is a display of the peak elevations
24 of your downstream model results as they move from the
25 top of your -- or the upstream area of your model

1 domain all the way to the downstream part of your model
2 domain, correct?

3 A. That is correct, yes.

4 Q. Okay. Now, the blue -- the -- there are two
5 sort of blue lines that traverse from the top left to
6 the bottom right, correct?

7 A. Yes.

8 Q. Okay. And the solid blue line represents
9 your actual results, what you believe actually happened
10 in Harvey according to your model, correct?

11 A. That's the model gates opened. This is
12 directly out of the model, correct.

13 Q. Yes.

14 And then there is the blue dashed line that
15 occurs -- let's -- we'll zoom in a little to make it a
16 little easier.

17 There's the blue dashed line that represents
18 what would have happened if the -- according to your
19 model if the gates had stayed closed, correct?

20 A. This represents the pure modeling output for
21 the gates closed.

22 Q. Okay. And starting at around the -- you had
23 the gauges marked in purple; is that right?

24 A. That is correct, yes. And then they're
25 labeled with a callout there with the gates number and

1 title, yes.

2 Q. Okay. And so if you look at the far left
3 side of the screen at the State Highway 6 gauge, and
4 just to put a reference point for the court, I mean,
5 that's -- that's right around where the corps project
6 office is?

7 A. Correct, yeah. It's the extreme upstream
8 side.

9 MS. DUNCAN: So you'll get to see that on
10 Thursday, Your Honor. So that's just to orient you
11 where we are.

12 BY MS. DUNCAN:

13 Q. You'd agree that the dashed line is, I don't
14 know, approximately 4 feet lower than the solid line at
15 the Highway 6 gauge?

16 A. Approximately.

17 Q. Okay.

18 A. Yes.

19 Q. So that means that according to your model
20 the opening of the gates then caused 4 additional feet
21 of flooding? Is that what it says?

22 A. At this point, yes.

23 Q. Okay. And then if we go all the way down to
24 the Piney Point gauge, you'd agree that between State
25 Highway 6 and Piney Point, that 4 feet begins to shrink

1 and the distance between the two scenarios becomes less
2 and less and less until you get to about Piney Point,
3 correct?

4 A. From this modeling, there's a diminishing
5 difference between open gates and closed gate. The
6 model does show it starts to converge at that point.
7 But when you look at observations, there's some
8 differences and I provided a narrative description of
9 some of that in my report. But based on the pure
10 modeling, it does start to diminish up to that point.

11 Q. Okay. And then at that point, according to
12 the modeling, there's not a difference in the peak
13 elevation for your open -- gates open/gates closed
14 elevations, correct?

15 A. When you look at just the modeling output, it
16 does diminish at that point. And then we looked at
17 observed conditions of the timing of the flows and I
18 have some narrative on that of potentially what could
19 be happening further down below Piney Point.

20 Q. Okay.

21 MS. DUNCAN: So let's go back to the full
22 screen.

23 BY MS. DUNCAN:

24 Q. So just put us into perspective, do you know
25 at approximately which -- well, would you agree that

1 the Piney Point gauge is approximately, what, halfway
2 between or more between the Addicks Reservoir and
3 downtown?

4 A. Approximately.

5 Q. Okay. And so starting between the Piney
6 Point gauge and the very last part of your domain at
7 the bottom numbers 80538, there's not a difference in
8 the peak of the open and closed gates scenarios for
9 your modeling, correct?

10 A. My modeling shows very similar peaks, but
11 there's another part of that, on the hydrograph there's
12 definitely a distinct longer duration of flooding, I
13 think somewhere like 13, 14 days longer flooding at
14 these points.

15 Q. Okay.

16 MS. DUNCAN: So let's go to PDF page 49. I'm
17 sorry. Let's look at PDF page 50.

18 BY MS. DUNCAN:

19 Q. I'd like to talk about table 6-4 in your
20 report.

21 Okay. So if we look at --

22 MS. DUNCAN: Let's just start with the Cutts
23 property, No. 9, and let's zoom in there. Great.

24 BY MS. DUNCAN:

25 Q. And so let me just establish what we're

1 looking at here. You've got each of the properties
2 listed on the left-hand side; is that correct?

3 A. That is correct. Yes.

4 Q. Okay. And in the center you have two columns
5 that I want to ask you about. And that is Model Gates
6 Open Peak Elevation?

7 A. Yes.

8 Q. And that's what your model predicts when the
9 gates were open during Harvey, what the peak elevation
10 was; is that right?

11 A. That is correct, yes.

12 Q. And then you've got right next to it a column
13 for Model Gates Closed Peak Elevation which is the peak
14 elevation if the gates stayed closed; is that correct?

15 A. That is correct, yes.

16 Q. Okay. And so the difference for example for
17 the No. 9 Cutts property is .13 feet; is that correct?

18 A. That's on this table. And just to, you know,
19 expound a little bit on this, so this is in a series in
20 Section 5 I talked about the methodology, 6 is the pure
21 output, pure model, and then in Section 7 it's
22 important where I look at each of these elevations and
23 I look at observed conditions and then I interpret the
24 model just because the model is just one element of
25 looking at it of the output. So then I go into looking

1 at observed conditions, gauge data, the timing of it,
2 and then look at that and talk about the difference in
3 there. So...

4 Q. So I'm really interested in your model
5 results. So let's talk about those.

6 So for the Cutts property, the difference
7 between your gates-open and gates-closed scenario is
8 .13 feet, correct?

9 A. Again, going back at the pure model for this
10 extreme, but, again, all models need to be interpreted
11 by an engineer that's developing those to be able to go
12 back and look at how do they actually apply to the
13 specific one. The models, it reports out to tenths and
14 hundreds of a foot but it's looking at the accuracy
15 that you need to be able to look at, observed data,
16 interpret that information going in there.

17 So, yes, as far as the specific model output,
18 the numbers on here, but then you end up -- you really
19 need to be able to interpret that as an engineer
20 looking at all the other information that comes in.

21 Q. And the difference for No. 10, Mr. Beyoglu,
22 the Beyoglu property, is the difference between the
23 peak gates open and closed is zero, correct?

24 A. For this, in this one right here, you know,
25 follow on is actually some of the slab elevation for

1 the Beyoglu. There's a difference. I think there was
2 subsequent from Dr. Nairn that has it 65 versus 70.
3 There's some conflicting information on the slab.
4 Again, going back here, this is just looking at pure
5 inundation at the slab, but then going back and looking
6 at the difference of elevation and then going back to
7 the actual true elevations on the graph.

8 Q. So I'm just asking about the inundation
9 levels; not the slab, not the left-hand column. I'm
10 looking at the two columns that are circled in blue
11 right here, Model Gates Open Peak and Model Gates
12 Closed Peak. The difference for Mr. Beyoglu in those
13 elevations is zero, correct?

14 A. Again, the slab is actually important because
15 this inundation is measuring the height of water above
16 the slab. If I move that slab down to a 65 which I
17 think was the right elevation, that actually
18 corresponds to observed conditions that inundation for
19 gates open/gates closed would be much different. There
20 would be a higher inundation going back. I'd have to
21 look at the actual elevation that I have from the
22 model. It's not on this one. I do a series of tables
23 side-by-side.

24 Q. And for the No. 11, Azar property, the
25 difference in the peak gates open and gates closed

1 inundation is zero, correct?

2 A. When you look at the pure model. Again, you
3 go back and you need to interpret what was being
4 observed out there and then also just as far as the
5 limitations of this model looking at that distance
6 downstream.

7 Q. And for Mr. Stahl, No. 12, the difference
8 between the gates open and the gates closed peak
9 inundation is also zero?

10 A. Again, I'll go back to the model itself.
11 There's stated limitations in the model. When you go
12 downstream you need to interpret those.

13 Q. Okay. But the answer is yes, that the
14 difference between those is zero, correct? The model
15 difference, the --

16 A. The model difference what it's showing in the
17 model itself, but it's still a go back, I wouldn't
18 state -- my opinion is not that the difference is zero.
19 I want to make sure there's a distinction.

20 Q. Okay.

21 A. Section 7 I go through and have my opinion of
22 what the difference is for each property. Just any
23 good engineer needs to be able to look at the model for
24 what it is, how it was built, what the limitations are,
25 and then take observed conditions. It's real important

1 to look at observed conditions both on the observed of
2 what was at that property and then also the gauge data
3 that was out there and then tie all that back together.

4 Q. Okay. Understood. But let's just make it a
5 clean record here.

6 Same question for No. 13, just talking about
7 your model output for Gates Open Peak Elevation and
8 Gates Closed Peak Elevation, the difference for
9 Mr. Welling and the two elevations is zero, correct?

10 A. Same answer, go back to the modeling itself.
11 It's important to be able to look at 7 through
12 interpretation for the modeling it shows here zero, but
13 then there's a clear interpretation later of how we
14 interpret this modeling data based on observed
15 conditions.

16 Q. Okay. Now, for several properties in your
17 model you estimate inundation prior to the reservoir
18 gates opening, correct?

19 A. There's a few I do, yes.

20 MS. DUNCAN: So let's look at PDF 66. Okay.
21 And we can zoom in.

22 BY MS. DUNCAN:

23 Q. You agree that figure 6-5L is your hydrograph
24 for the Stahl property?

25 A. Yes.

1 Q. Okay. Now, we've established that the
2 releases began on August 28th, correct?

3 A. That is correct, yeah, the morning of the
4 28th.

5 Q. And it takes approximately -- well, at least
6 eight hours for water to move from the reservoirs all
7 the way down to the Stahl property, correct?

8 A. There's a time gap between that floodway of
9 going from upstream to downstream.

10 Q. And do you know what that time gap is?

11 A. Off the top of my head, I don't. I believe I
12 have some numbers in my report, but I don't off the top
13 of my head.

14 Q. Would it surprise you if it was eight or more
15 than eight hours?

16 A. It wouldn't surprise me if it's in the order
17 of eight.

18 Q. Okay.

19 MS. DUNCAN: And so why don't we just mark
20 August 28th on this chart, okay? Consistent with the
21 answer from the witness.

22 BY MS. DUNCAN:

23 Q. And now you'd agree that the -- similar to
24 the table 11 that we talked about, this figure displays
25 your results for the actual scenario in a solid blue

1 line, correct?

2 A. That is correct, yes.

3 Q. And it displays your gates open results in a
4 dashed blue line, correct?

5 A. That is correct, yes.

6 Q. Now, the -- there is no difference in the
7 lines until you get to late in the day on the 28th,
8 correct?

9 A. On this graph, that's correct.

10 Again, I want to go back. And if we can, for
11 interpreting this graph, again, I went through a very
12 scientific methodical way, I set up the model,
13 presented just the pure modeling results, presented
14 this just so I was very transparent and then did an
15 interpretation of all the database and observed
16 condition.

17 Q. And I just have some simple questions about
18 your model output.

19 A. Sure.

20 Q. Your counsel can certainly ask any additional
21 questions they think are important.

22 So my follow-up questions for you here are
23 that the first peak on this property, first peak
24 elevation occurred before August 28th when the releases
25 began, correct?

1 A. That's what I -- that's what is showing on
2 here.

3 And, again, going back, from what I remember
4 on Stahl right here, I think in my report I mentioned
5 that I was not able to make a conclusion on here
6 because there wasn't sufficient information at this
7 location.

8 Q. Right.

9 So the reason I want to talk about Stahl is
10 that you concluded you couldn't make a conclusion on
11 him, correct?

12 A. Well, yeah, being very transparent of which
13 properties I can and which ones I can't. So I want to
14 be, yeah, full disclosure of which ones I could make a
15 determination from based on engineering judgment.

16 MR. McGEHEE: Objection. Relevance, Your
17 Honor. Stahl has been dismissed from this case.

18 THE COURT: Oh.

19 MS. DUNCAN: Your Honor, the reason we're
20 bringing up Stahl is, one, he analyzed it and he used
21 the same purported methodology to analyze this one and
22 the two others right nearby. You can see right here is
23 Mr. Stahl right here, 12, this is Mr. Azar, this is
24 Mr. Welling. I'm going to show you how similar the
25 results for these two are to No. 12, Mr. Stahl, and yet

1 he still concluded that there was causation for Welling
2 and Azar, but not Stahl. It doesn't add up. So it
3 goes to the credibility, Your Honor.

4 THE COURT: Okay. You can use it for
5 credibility. It certainly seems relevant.

6 BY MS. DUNCAN:

7 Q. Okay. Mr. Bardol, you'd agree that the
8 second peak at the Stahl property also occurred before
9 the reservoir releases reached the Stahl -- reached the
10 Stahl property, correct? According to the model?

11 A. According to the model. And one thing I'll
12 just go back in here just kind of looking at this
13 property again here, there's a model, there's
14 interpretation the one thing that was clear in my model
15 as far as we're not taking in the side flows I believe
16 Stahl is right next to -- and I'm looking at -- I told
17 you I would -- figure 3.1 in my graph. It's just an
18 overview. It's Spring Branch it comes right in at
19 Stahl so that very kind of unique element where it is
20 different between the upstream and the downstream
21 property there's a high inflow with Spring Branch is
22 coming in right at that point where the model that I
23 had set up wasn't really distinctly showing that. That
24 portion as far as on the hydrologic, the hydrology
25 coming in. So there is actually a very distinct

1 element that is at this property versus the other two.
2 I just want to make sure it's clear that this property
3 is different than the other two.

4 Q. Okay. So you're saying that the shape of the
5 hydrograph is you're saying is influenced by the fact
6 that there is other forms of flooding nearby?

7 A. Just the interpretation of this graph and the
8 other observed condition, this location in the model
9 is -- is very different than the others is all I'm
10 saying.

11 Q. Okay. So let's go --

12 THE COURT: If we're getting close to
13 about -- let's take a break in a few minutes. I'll
14 give you a chance to wrap up this line.

15 MS. DUNCAN: Your Honor, I can wrap up this
16 section in just a few, just a few minutes.

17 THE COURT: Okay.

18 MS. DUNCAN: Yeah. And it's a good stopping
19 point. And I'm getting very close, Your Honor.

20 THE COURT: To the end?

21 MS. DUNCAN: Yes.

22 THE COURT: Okay.

23 MS. DUNCAN: But I'll finish after the break,
24 Your Honor.

25 Okay. So PX 14, let's go to page 65.

1 BY MS. DUNCAN:

2 Q. Now, Mr. Bardol, these are your modeled
3 results for Mr. Azar --

4 A. Yes.

5 Q. -- correct? Okay.

6 Now, and, of course, as before, the reservoir
7 releases started early on August 28th, correct?

8 A. Yes.

9 MS. DUNCAN: Let's mark that with a red line.

10 Q. Now, the divergence in your two modeled
11 scenarios does not occur until late in the day on
12 August 28th, correct?

13 A. When you look at just the modeling results,
14 it does occur then.

15 Q. Okay. And the first peak for this property
16 occurred on August 27th, prior to the releases
17 occurring, correct?

18 A. That's what my model shows.

19 Q. And your model also shows that the second
20 peak for the modeling occurred before the releases even
21 got down to the property, correct?

22 A. It does start to show an increase in water
23 surface elevation.

24 Q. And what this means is that with the
25 release -- with or without the releases, there --

1 according to your model, there was going to be the same
2 peak level of flooding which occurred on the 27th,
3 correct?

4 A. And I believe my report says so much where we
5 look at the initial high water, the main difference
6 where I go into it is the extra 12, 13 days where after
7 there's that initial flood since it's fairly, you know,
8 far downstream the dash line comes back down, so it
9 would have two and a half days estimate of flooding but
10 then there's another 13 -- or 12, 13 days of flooding
11 since it goes through the induced surcharge and there's
12 that extended drawdown. So that home, you know, the
13 dash line there is the slab elevation, so there was
14 initial flooding before the releases being very, you
15 know, clear in my report of that but then you have this
16 very significant extended duration of flooding
17 afterwards.

18 Q. And for this property, Mr. Azar your
19 causation opinion is limited to the additional duration
20 of the flooding, correct?

21 A. Again, that's where I want to be clear,
22 there's the modeling and then Section 7, if I can read
23 that section, if we can pull that up, I just don't want
24 to misquote anything that I have in the report because
25 I went through that process of looking at the model

1 results and writing it down in Section 7 for each
2 property.

3 Q. Sure. Okay. Well, we're going to focus on
4 the model results here. Counsel can ask you more if
5 that's helpful.

6 A. That's fine.

7 MS. DUNCAN: Okay. So let's finally look at
8 PX 14, PDF 67. And this is the last one we're going to
9 look at. Let's zoom in.

10 BY MS. DUNCAN:

11 Q. Now, again, releases happen on August 28th,
12 correct?

13 A. That is correct.

14 Q. Okay.

15 A. Yes.

16 Q. And releases here take at least eight hours
17 to reach the property, correct?

18 A. It would be on that order, yes.

19 Q. Okay. And then the diversions between the
20 open and -- gates-open and gates-closed scenarios from
21 your model doesn't happen until almost August 29th; is
22 that correct?

23 A. For this. And, again, in my report here, I'm
24 very clear that down here I'm underpredicting, my model
25 is underpredicting what those peak flows are due to how

1 the model is set up that extent down there. This dash
2 line right here and then -- that's going horizontal at
3 about the 39, and then the blue line at the top that's
4 about the 49, that shows the inundation of what was
5 reporting on flooding.

6 So I'm really clear that the model down at
7 this point I'm underpredicting the elevations and then
8 started to rely on observed conditions and all the
9 other stuff that's going on downstream because the
10 model it was kind of at the very end of, you know, the
11 end of the limits. It was really the upstream I was
12 more confident. When you get down here I was relying
13 on this compared to the extended duration of this --
14 the hydrograph that's going out past, you know, another
15 three, four, six days. But then I'm clear that I'm
16 underpredicting, the model is underpredicting. I just
17 didn't have enough information for that area.

18 Q. Okay. So let's just also make sure the
19 record is clear that the gray dashed line cuts off --
20 cuts across it around elevation 39, you mentioned that?

21 A. Yes.

22 Q. That's the slab elevation for the Welling
23 property, correct?

24 A. That is the slab elevation.

25 Q. Okay. And below the -- the gates open and

1 gates closed model results don't differ until many --
2 at least 4 feet below the slab elevation, correct?

3 A. Again, going to the modeling, all of this has
4 to go through interpretation. I ran through the model.
5 This model is not going to have it down to -- you know,
6 at this area, I say it's beyond the model's capability
7 and I'm underpredicting, and then I had a decision
8 point to go back and readjust the model for this area
9 or relying on observed conditions and the report, there
10 was good reporting at this area and based on other
11 elevations.

12 So I'm very clear that this model is
13 underpredicting the overall water surface elevation.
14 And my opinion is based not just solely on the
15 modeling, because I'm using that to interpret there's
16 an extended drawdown, and you can kind of see the blue
17 line that extends way out, I'm underpredicting the
18 peaks because some of the other gauge data that's much
19 higher than what my model was showing, and I said it's
20 reasonable that since they showed one, two, three,
21 four days of flooding, if you looked at just the
22 hydrograph of the initial release of the storm, it
23 wouldn't have listed that long, it would be due to
24 induced surcharge.

25 MS. DUNCAN: Now, let's go PDF 75 of this

1 property.

2 BY MS. DUNCAN:

3 Q. Now, for some properties, you make -- you
4 opine that the releases are the sole cause of the
5 flooding on the property, correct?

6 A. I do, yes, for primarily upstream of
7 Beltway 8. And I think I'm in agreement with Dr. Nairn
8 up there. These down here, it's really that extended
9 duration that would have flooded still without, but it
10 really the -- the additional flooding, the duration of
11 flooding was much longer due to induced surcharge.

12 Q. And for Mr. Welling, that extended duration
13 you're speaking of was, you know, on the order of many
14 feet below the slab elevation, correct?

15 A. Again, you're kind of mixing between -- this
16 is looking at Section 7, which is my engineering
17 interpretation, my opinion. Section 6 was the pure
18 modeling result. Again, no model should just be taken
19 at face value. You need to take what was put into it,
20 and then looked at that elevation. So I used that.
21 And I'm very clear, I'm not trying to hide anything. I
22 looked at the model, looked at the results, looked at
23 observed condition which need to be taken into account,
24 and then use that to draw this opinion.

25 Q. So in Section 7 which you mentioned several

1 times --

2 A. Yes.

3 Q. -- you know, you don't talk about your
4 conclusions on the Welling property in the terms of
5 sole cause. You talk about it in the context that the
6 increase in inundation could, "reasonably be the result
7 of the induced surcharge releases," correct?

8 A. Correct. There's upstream properties,
9 primarily upstream of Beltway 8, that it's my opinion
10 that it's the induced surcharge was the sole. I want
11 to be very clear, these downstream properties, it
12 was -- part of these flooded before, and still being
13 transparent between what the model and observed
14 conditions, but still there's a distinct increase in
15 duration of flooding at these properties down there in
16 my opinion.

17 MS. DUNCAN: Your Honor, this is a good time
18 for a break.

19 THE COURT: Okay. We'll take a ten-minute
20 break. It's 3:01. We'll at 3:11.

21 (Off the record from 3:01 until 3:25.)

22 THE COURT: Sorry about the delay. I may
23 have sorted out ADT's security system. I have a friend
24 who has helped me go in to water plants and get the
25 mail and things and found out how little tricky that

1 alarm is. All right.

2 MS. DUNCAN: Okay.

3 THE COURT: You may proceed.

4 MS. DUNCAN: Thank you.

5 BY MS. DUNCAN:

6 Q. Mr. Bardol, in addition to your model for
7 downstream, you prepared a model for the upstream area
8 as well, correct?

9 A. I prepared a 2D model to look at -- quantify
10 the flanking flows underneath the two different
11 scenarios.

12 Q. And you say "2D" and that's a two-dimensional
13 model, correct?

14 A. Yes, it was a two-dimensional model.

15 Q. And you didn't use a two-dimensional model
16 for your downstream inundation opinions, correct?

17 A. We used a two-part model. As part of that we
18 had a 2D that extended downstream that actually was
19 developed by the corps. They had a really good model.
20 We used that to figure out where and quantify the flows
21 as they flanked, if and when they flanked, where they
22 would reenter into Buffalo Bayou so we used that. But
23 then we used the 1D model that was also used by the
24 corps and also Harris County Flood Control District for
25 the one-dimensional modeling that goes to Buffalo

1 Bayou. So that was the standard that was used by the
2 different agencies there which we used.

3 Q. Okay. You agree that as to the upstream, the
4 reservoir pool in your gates-closed scenario would be a
5 higher elevation than your gate-open scenario, correct?

6 A. If the gates were closed, it would be a
7 higher elevation. I think it goes from 109.01 up to a
8 110 something. It's a little over a foot higher for
9 the gates-closed scenario for Addicks.

10 Q. Okay. And similarly, Barker is also higher
11 in the gates closed than it is in the gate open,
12 correct?

13 A. Barker would be higher. One thing that's
14 unique on that, there would be no flanking flows so
15 there would be no uncontrolled discharges around the
16 auxiliary spillways.

17 Q. But at Barker, the difference between your
18 gates open and gates closed is 2.4 feet?

19 A. Correct. I believe it was right around 2 1/2
20 feet but still there would be no flanking flows. It
21 would have never activated either of the auxiliary
22 spillways.

23 Q. You didn't quantify how many additional
24 properties upstream would be flooded in a gates-closed
25 scenario, correct?

1 A. I did not analyze the properties upstream. I
2 was just looking at the -- following the elevations and
3 the control manual and then looking at what the
4 releases would be underneath the different scenarios.

5 MS. DUNCAN: Let's look at PDF 14. This is
6 your report. Excuse me, PX 14 at PDF 53 and 54.

7 BY MS. DUNCAN:

8 Q. And this, Mr. Bardol, is figure 6-3 and
9 figure 6-4.

10 Now, these -- this is the inundation mapping
11 for your two model scenarios for the upstream areas,
12 correct?

13 A. That is correct. This is the -- a visual
14 representation of the model results.

15 Q. Okay. And you've got the gates closed on the
16 left and gates open on the right; is that correct?

17 A. That is correct.

18 Q. Okay. Now --

19 MR. McGEHEE: Objection, Your Honor, just for
20 time purposes, relevance.

21 THE COURT: What is -- what is the relevance?

22 MS. DUNCAN: Your Honor has asked what would
23 have happened if the corps had kept the gate closed and
24 what Mr. Bardol's own results show is that there is
25 going to be more flooding and we're about to talk about

1 how much more flooding would be occurring upstream.

2 MR. McGEHEE: And that's the relevance, Your
3 Honor.

4 THE COURT: Yeah, why is that relevant to
5 this case which we're dealing with the downstream
6 flooding?

7 MS. DUNCAN: Because, Your Honor, the
8 question is the overall impact. So what you're going
9 to hear over the course of the trial is that whether
10 the corps kept the gates open or kept it closed,
11 someone was going to flood. So the impact of opening
12 the gates versus closing just means that flooding would
13 be shifted around. So if the corps had kept them
14 closed, you'll find that the upstream areas would have
15 flooded more and a lot more. And so it's not a sort
16 of -- it's not a freebie. You can't just choose to
17 keep the gates closed and then no one floods. Given
18 the amount of rain, someone will flood.

19 THE COURT: Right. But that doesn't get to
20 the claim here, the taking, because the government
21 chose to flood the downstream people. I mean, the
22 argument is the -- the basic argument is this is done
23 by a conscious policy following the rules that the
24 corps had set up, they followed that and that caused
25 the flooding, so it was the conscious policy that

1 caused the flooding.

2 MR. McGEHEE: And, yes, sir, and, again, we
3 stipulated that the Water Control Manual is the reason
4 why the gates were open and it has nothing to do with
5 upstream flooding.

6 THE COURT: Yeah. But whether it does or
7 doesn't, doesn't seem to me to make upstream flooding
8 any more relevant.

9 MS. DUNCAN: Well, so, Your Honor, we
10 understood that there are sort of two components to
11 this trial. The first is the, you know, whether there
12 was an emergency that made it necessary to open the
13 gates.

14 THE COURT: Right.

15 MS. DUNCAN: And so the increased flooding
16 upstream that would -- excuse me, that led it to
17 opening the gates, and so it is relevant to that
18 question as to what -- as to how much additional
19 flooding would have been put on that land upstream if
20 the gates had been kept closed. It relates to the
21 overall emergency and is context for the opening and
22 closing of the gates.

23 Additionally, Your Honor, you asked what
24 would have happened had the corps taken alternative
25 action including keep the gates closed. And so

1 plaintiffs don't want you to hear about all of the
2 other people that would be flooded if the corps had
3 just kept the gates closed. But that's what their
4 modeling is going to show.

5 And finally, the test here --

6 THE COURT: It's relevant for that purpose,
7 I'll allow it for that purpose, to show that the corps
8 couldn't, without causing some flooding, close the
9 gates or leave them closed.

10 BY MS. DUNCAN:

11 Q. Now, Mr. Bardol, in your report, you don't
12 compare your gates open and gate scenario for the
13 upstream modeling, do you?

14 A. When you say "compare," I mean, I compare as
15 far as these pictures here, these graphs. I talk about
16 the flanking flows, uncontrolled flows, you know, it
17 increased from about 2,000 up to, you know, 5,600, I
18 looked at the number, but then looked at the net
19 reduction of flooding out of the two outlets reducing
20 from 13,000 plus 13,800, you know, 14-, 15,000 going
21 down to zero, so I look at those comparisons and then
22 what would go to the smaller flanking flows.

23 Q. Okay. And but you never overlay figure 6-3
24 and 6-4 over each other in your report, do you?

25 A. I present the side-by-sides as you have here

1 so you can see the differences and just for dramatic
2 purposes here I show the depth of flooding being zero
3 to 2 feet which is the blue. So showing an overlay I
4 think it's much clearer if you do a side-by-side like
5 this I'm showing, you know, that there is increased,
6 you know, you say flooding, this inundation, but that's
7 at the zero to 2 feet area based on the coloration
8 versus on the left you end up seeing a significant
9 amount of flooding within Buffalo Bayou.

10 Q. And if when you're talking about the graphic
11 visualization of it, if you look at the far right-hand
12 side of figure 6-4, the additional blue that spans
13 around the end of the Addicks emergency spillway is
14 shown in that right-hand side of 6-4, correct?

15 A. There is an increased flow if the gates are
16 closed, so you do have this very widespread flow coming
17 around at the lower depth of elevation, zero to 2 feet
18 versus, you know, the dark red that's on the left
19 within the Buffalo Bayou which is at the 16 feet plus,
20 some areas it's 25 to 30 feet within the channel itself
21 that get basically eliminated.

22 MS. DUNCAN: So let's put up JX 175.

23 BY MS. DUNCAN:

24 Q. Mr. Bardol, on this first slide of JX 175 is
25 the side-by-side view from your report of pages --

1 figure 6-3 and 6-4, correct?

2 A. That is correct.

3 Q. Okay.

4 MS. DUNCAN: And if we move to the next
5 slide, PDF 2 of JX 175.

6 BY MS. DUNCAN:

7 Q. Now, this is the map we've discussed before.
8 This is the overlay of the inundation beyond
9 government-owned land for your gates-closed and
10 gates-opened scenario, correct?

11 A. This looks like it's an overlay. What this
12 doesn't have on the other one that provides some depth
13 to it is actually the actual depth of flooding, you
14 know, so this is just as I understand the lateral
15 extent, but on that red area where it shows where there
16 would be inundation, that's at a pretty low elevation,
17 zero to 2 feet. And then as far as the light blue
18 where it's going away in the Buffalo Bayou, you know,
19 that's 15, 20 feet difference in there. So it doesn't
20 have the elevation, but this is showing the lateral
21 extent, correct.

22 Q. So if we're reading this chart, any time that
23 we can see the orange is additional areas that will
24 flood pursuant to your modeling compared to the
25 gates-open scenario?

1 A. I just wanted to clarify, that's -- this is
2 just a lateral extent. I just want to make sure, you
3 know, it's understood. Lateral extent but there's not
4 a depth on here, so some of this red area -- I guess
5 what I'm getting at is not all flooding was created
6 equal. Some of this red area might only be zero to
7 2 feet deep on the right side of Addicks, but that blue
8 area, that light blue that's below Addicks and Barker
9 where that goes away, some of that goes away, you know,
10 that might be 6, 7, 8 feet, 10 feet difference of it
11 would drop if it's closed.

12 MS. DUNCAN: Let's look at PDF page 2.
13 Sorry. The next page. I think it's PDF 3. Slide 3.
14 BY MS. DUNCAN:

15 Q. Now this is a picture of Barker Reservoir
16 comparing your 2D model gates open/gates closed results
17 in the form of an inundation map, correct?

18 A. I understand that -- I'll take it for granted
19 that they did an overlay of my GIS maps appropriately.
20 But, again, so this shows the lateral extent. It
21 doesn't show a difference in flood depth. So some of
22 the stuff on the red, the left, how it looks like this
23 is it's flooding within the streets, so it doesn't look
24 like it's impacting homes so that's probably low-level
25 depth of flooding, that's, you know, consistent with

1 what my model showed.

2 Q. And in your gates-closed scenario, you would
3 agree that the areas in blue would be flooded deeper
4 than they would be? So, in other words, the flooding
5 in the gates-closed scenario will be deeper than that
6 in the gates-open scenario, correct?

7 A. In some of these blue areas, it would be
8 deeper.

9 Q. Okay.

10 MS. DUNCAN: And then let's move on to PDF 6.
11 Slide 6.

12 BY MS. DUNCAN:

13 Q. Okay. And, again, the light blue is your
14 gates open 2D model results and your orange is the
15 gates closed model results, correct?

16 A. That is correct.

17 Q. Okay. Now, you mentioned that by keeping the
18 gates closed, the Addicks Reservoir would be 1.17 feet
19 higher; is that right?

20 A. That's correct.

21 Q. Okay. And according to your model, keeping
22 the gates closed would flood approximately an
23 additional 1,000 acres upstream of Addicks Reservoir?

24 A. When you -- yes, it would flood additional
25 acreage up there, then the flanking, but then would be

1 a significant decrease of water flow and flooding
2 downstream.

3 Q. And so that's a yes, it would flood an
4 approximately additional 1,000 acres upstream of
5 Addicks Reservoir in your gates-closed scenario,
6 correct?

7 A. Looking at this overlay, yes.

8 Q. Okay. And if we move to Barker --

9 MS. DUNCAN: Let's go back to page 3.

10 BY MS. DUNCAN:

11 Q. We discussed that the difference in your
12 gates-open and gates-closed scenario is approximately
13 2.5 feet, correct?

14 A. That is correct.

15 Q. And according to your model, keeping the
16 gates closed would flood approximately an additional
17 2,000 acres upstream of Barker Reservoir, correct?

18 A. With the corresponding reduction of flooding
19 downstream, but there would be the increase up but less
20 flooding downstream.

21 Q. Under your gates-closed scenario, the
22 flooding upstream would last longer if the gates are
23 closed than it does with the gates open, correct?

24 A. And similarly with the gates closed, the
25 flooding downstream would correspond less.

1 Q. And so that's a yes to my question?

2 A. Yes.

3 MS. DUNCAN: If we go to PDF 48 -- I'm sorry,
4 PX 14, PDF -- let's go to 48. And let's zoom in on
5 table 6-2.

6 BY MS. DUNCAN:

7 Q. Now, you mentioned that you did compare
8 various metrics between your gates-open and
9 gates-closed scenario, correct?

10 A. I did compare.

11 Q. And if the gates are kept closed, you can see
12 on the far right-hand side the amount of flow that's
13 going to be going into one of four tributaries on
14 the -- that are to the east of Addicks Reservoir; is
15 that right?

16 A. Correct, yes.

17 Q. Okay. And similarly, the middle column
18 relates to the amount of flow that flows into the four
19 tributaries under your gates-open scenario, correct?

20 A. The middle is the gates opened.

21 Q. Okay. And for Turkey Creek, the flanking
22 flow in the gates-closed scenario is more than double
23 the flanking flow in the gates-open scenario, correct?

24 A. Turkey Creek does receive an increase of
25 about double, but then there's a larger increase of --

1 decrease what's going into Buffalo Bayou.

2 Q. Okay. And Turkey Creek, does it come right
3 through here? Are you familiar?

4 A. I believe, yeah. I don't want to -- I think
5 it's Turkey Creek, it would -- you know, there's Rummel
6 Creek. I believe this is from upstream and downstream.
7 Turkey, Rummel, Spring, and then White Oak.

8 Q. Okay. And so those tributaries move from
9 west beside the reservoir out to the east, correct?

10 A. That is correct.

11 Q. Okay. And we're talking about the flanking
12 flow then flowing into those other channels, correct?

13 A. Correct. We wanted to make sure that when we
14 modeled it it would come back in. So, you know, a
15 complete model of how it would come back into Buffalo
16 Bayou.

17 Q. Okay. And in your gates-closed scenario, the
18 flanking flow reaching Rummel Creek is more than 80
19 times the flanking flow in the gates-open scenario,
20 correct?

21 A. There's percentages that the small go and 10
22 up this up, yeah, it makes it seem much bigger.
23 There's already a significant amount of water that's
24 out there, so it does increase from 10 up to 829.

25 Q. And in your gates-closed scenario, the

1 flanking flow reaching Spring Branch Creek is six times
2 the amount than in the gates-open scenario, correct?

3 A. It increases from 173 to a little over 1,200.

4 Q. Okay. And the -- you know that the White Oak
5 Bayou -- excuse me. And then the last one is White Oak
6 Bayou. So in your gates-closed scenario, the flanking
7 flow reaching the White Oak Bayou is three times the
8 amount in the gates-open scenario, correct?

9 A. It is higher.

10 Q. And it's three times higher? According to
11 your --

12 A. According to this, yes.

13 Q. Okay. Now, during the Harvey event -- these
14 are questions about your 2D model results from your
15 model and reported in your report, so during the Harvey
16 event your actual model estimates a peak inflow to
17 Addicks Reservoir that was about 74,000 cfs?

18 A. That sounds about right, yes.

19 Q. And during the Harvey event, the peak outflow
20 from the Addicks Reservoir was 6,440 cfs?

21 A. That sounds about right, yes.

22 Q. And 6,440 cfs divided by 74,000 cfs is
23 8.7 percent?

24 A. That sounds about right. And then the gates
25 scenario would be zero for comparison.

1 Q. Okay. And during the Harvey event your
2 actual model estimates a peak inflow to Barker
3 Reservoir at 81,000 --

4 A. That sounds --

5 Q. -- cubic feet per second?

6 A. That sounds about right, yes.

7 Q. Just so we're clear what that means, what
8 that means is 81,000 cfs flowing into the reservoir,
9 correct?

10 A. That is correct, the flow coming into it.

11 Q. And your model shows that it's -- the release
12 is then constricted down to a smaller amount, correct?

13 A. Correct.

14 Q. Okay. And the peak outflow during -- from
15 Barker during the Harvey event was 4,900 cfs?

16 A. That sounds about accurate.

17 Q. Okay. And so 4,900 cfs divided by 81,000 cfs
18 is 6.2 percent, correct?

19 A. Yes.

20 Q. Okay.

21 A. All that is in my report, yes.

22 Q. Those percentages are in your report?

23 A. Well, all the numbers. I mean, they -- you
24 can do percentages on them. But I'm just making it
25 clear that those numbers are in my report.

1 Q. Now, during Harvey, the peak flanking flows
2 around the end of the dam were estimated to be
3 2,000 cubic feet per second, correct?

4 A. Correct. And then we also did some modeling
5 that correspond today about 2,000 cfs.

6 Q. Okay. And to be precise, your model
7 estimates the peak flanking flow around the north end
8 of Addicks at 1,676 cfs, correct?

9 A. Yes, that sounds about right. And then I
10 think there was an estimate by the corps individual of
11 about 2,000 and we also ran it another way using the
12 Wheeler calc and it also about that. So we had three
13 different ways that kind of came back closer to 2,000.

14 Q. And if the corps had kept the gates closed
15 during Harvey, according to your model the flanking
16 flows around the north end of Addicks would be
17 5,710 cubic feet per second, correct?

18 A. Correct. Over a very long area, so it would
19 be very wide and shallow sheet flow coming across
20 there.

21 MS. DUNCAN: Your Honor, may I have one
22 moment?

23 THE COURT: Yes.

24 MS. DUNCAN: Your Honor, before we pass the
25 witness, we do have a number of exhibits to offer that

1 we have discussed throughout the day.

2 THE COURT: Okay.

3 MS. DUNCAN: Some were preadmitted, so I'll
4 just note that for the record.

5 THE COURT: Just read the ones that were not
6 preadmitted.

7 MS. DUNCAN: Okay. Well, just so we have a
8 clear record, the ones that we have that were already
9 preadmitted are PX 14, JX 2, and JX 3. Okay. And then
10 the ones that we do need to offer are JX 171.

11 Do you want me to just read them and then ask
12 about objections?

13 THE COURT: Yes, see if there are any
14 objections.

15 MS. DUNCAN: JX 171, DX 213, JX 54, JX --
16 sorry, DX 105, DX 114, DX 372, JX 13, JX 42, DX 637, JX
17 1, PX 47, and JX 175.

18 THE COURT: Okay. Any objections to any of
19 those?

20 MR. McGEHEE: No objections, Judge.

21 THE COURT: Okay. Those are all admitted.

22 (Admitted Exhibit No. JX 171.)

23 (Admitted Exhibit No. DX 213.)

24 (Admitted Exhibit No. JX 54.)

25 (Admitted Exhibit No. DX 105.)

1 (Admitted Exhibit No. DX 114.)

2 (Admitted Exhibit No. DX 372.)

3 (Admitted Exhibit No. JX 13.)

4 (Admitted Exhibit No. JX 42.)

5 (Admitted Exhibit No. DX 637.)

6 (Admitted Exhibit No. JX 1.)

7 (Admitted Exhibit No. PX 47.)

8 (Admitted Exhibit No. JX 175.)

9 THE COURT: Redirect.

10 MR. McGEHEE: Your Honor, my redirect is
11 going to take five minutes.

12 THE COURT: Okay.

13 MR. McGEHEE: May it please the court?

14 THE COURT: Yes.

15 REDIRECT EXAMINATION

16 BY MR. McGEHEE:

17 Q. Mr. Bardol, what represents reality, a model
18 result or observed results?

19 A. The observed results and the observed
20 conditions that we're seeing out in the field at the
21 homes along the Buffalo Bayou.

22 Q. And why is that?

23 A. The model is just going to try to take all
24 the different input as far as rain, conditions, input
25 it together for a very long time period. A lot of

1 variables. You end up doing that, but as far as
2 looking at basing on reality is going to be the
3 observed conditions out there.

4 Q. Would you expect Dr. Nairn to use the same
5 methodology using observed data and have that trump
6 model data?

7 A. Exactly. You would end up going through the
8 modeling and then you end up having that as a partial
9 representation and need to take into account observed
10 conditions to be able to compare to what the model is
11 trying to represent.

12 Q. And very briefly, is anything -- did anything
13 that opposing counsel said, did anything that she asked
14 you, did anything she show you change your opinion that
15 you and Dr. Nairn agreed on seven of the test
16 properties?

17 A. That's correct. We have a very similar
18 approach. And as far as the 1 through 9, substantially
19 agree and even in his report, the three that we focused
20 on here today -- Beyoglu, Azar, and Welling -- also
21 within his report he talks about that being an extended
22 duration that might not have increased elevation of
23 flooding but there was likely an increase in duration
24 of flooding, so, you know, similar --

25 Q. And even more globally, sir, did anything

1 that she said, anything she showed you or any questions
2 she asked you change your opinion that you -- both you
3 and Dr. Nairn think that a hundred percent of the test
4 property plaintiffs would be better off with the gates
5 open?

6 MS. DUNCAN: Objection.

7 THE WITNESS: No.

8 MS. DUNCAN: Misstates the opinion.

9 THE COURT: Well, it's asking for an opinion
10 on that issue. It isn't misstating anything that I've
11 seen.

12 MS. DUNCAN: Well, he's asking about an
13 opinion on Dr. Nairn.

14 THE COURT: Well, his opinion of Dr. Nairn,
15 is Dr. Nairn going to be testifying?

16 MS. DUNCAN: As of now, he is.

17 THE COURT: Okay. So he'll give his opinion
18 if it's different. The objection is overruled.

19 BY MR. McGEHEE:

20 Q. Opposing counsel said an emergency was
21 declared -- I'm sorry.

22 She talked about declaring an emergency. Do
23 you recall those questions?

24 A. I do, yes.

25 Q. And she showed you a portion of testimony

1 from Mr. Thomas that said Level 2 emergency was
2 reached. Now, I want to show you other testimony that
3 talk about a declaration of emergency and other
4 testimony from Thomas that might contradict her notion
5 that an Addicks/Barker emergency was declared and a
6 Level 2 emergency was reached according to the
7 Emergency Action Plan.

8 First of all, do you recall the testimony she
9 showed you for Mr. Thomas?

10 A. I do, yes.

11 Q. Okay.

12 MS. DUNCAN: Objection, Your Honor.

13 THE COURT: What's the objection?

14 MS. DUNCAN: My objection is that we tethered
15 our presentation to what doctor -- excuse me, what
16 Mr. Bardol had in his report, and we showed him a quote
17 to ask him if he considered it. Now we are going
18 beyond that scope. And now we're just going to end up
19 playing an entire witness' testimony by deposition when
20 that witness is sitting right here and ready to take
21 the stand. If anything, the time to bring that up is
22 on cross-examination or direct of that witness.

23 THE COURT: I think it raises something that
24 occurred on cross, it's permissible. I'll allow it.

25 MR. McGEHEE: For optional completeness,

1 let's see the other portion of Mr. Thomas's testimony
2 where he talked about whether or not a Level 2
3 emergency was reached.

4 And I'll read the highlight. And this is
5 just for optional completeness. And I'm just going to
6 ask if you've reviewed this and if you considered it.

7 "Question: Has there ever been a formal
8 declaration of a Level 2 emergency in the history of
9 the Addicks and Barker Dams and Reservoir?

10 "Answer: Not that I know of, sir.

11 "Question: Has there ever been a formal
12 declaration of Level 1 emergency?

13 "Answer: Not that I know of, sir.

14 "Question: Has there ever been a formal
15 declaration of Level 3 emergency?

16 "Answer: Not that I know of."

17 And that completes our optional completeness.

18 THE COURT: Okay. Anything else?

19 MR. McGEHEE: Yes, sir. And finally -- oh,
20 and this is PX 047.

21 BY MR. McGEHEE:

22 Q. And finally, opposing counsel said there was
23 a declaration of emergency, and then she showed you a
24 document, and she read from that document "Declaration
25 of Emergency" in paragraph 1.

1 You see what's on the chart and you see
2 paragraph 1 where it says "Declaration of Emergency"?

3 A. I do, yes.

4 Q. Does this have anything to do with emergency
5 situation at Addicks/Barker Reservoir?

6 A. Seeing the full part of this, like in
7 paragraph 3, it talks about expenses, but I don't see
8 anything for this one right here declaring it with
9 relation to Addicks and Barker for dam safety for those
10 facilities or those projects.

11 Q. This is for the overall Hurricane Harvey
12 tropical storm on August 22nd, correct?

13 A. Correct. Not for the -- the facility, the
14 project itself. This is for the general area of --

15 Q. And this says in accordance with a
16 regulation, ER 500-1-1 that we're going to talk about
17 later in detail. But this doesn't refer to a
18 declaration of emergency under the Emergency Action
19 Plan, correct?

20 A. Correct. This would be different than the
21 levels of declaration underneath the Emergency Action
22 Plan, underneath EAP.

23 Q. Yes, sir. In addition to what you pointed
24 out, this also discusses a declaration of emergency
25 paragraph 3 that deal with expenses and paragraph 4

1 deal with labor, paid labor and overtime, correct?

2 MS. DUNCAN: Objection.

3 THE WITNESS: That is correct.

4 MS. DUNCAN: Leading.

5 THE COURT: What's the objection?

6 MS. DUNCAN: Leading.

7 THE COURT: What?

8 MS. DUNCAN: Leading.

9 THE COURT: Oh. This one I think he is
10 focusing on the specific document, so that's not really
11 leading. He's not suggesting the answer. The answer
12 is in the document, so I'll allow the question.

13 BY MR. McGEHEE:

14 Q. Describe in your opinion if this is a
15 declaration of emergency under the Emergency Action
16 Plan.

17 A. Underneath the Emergency Action Plan, no, it
18 wouldn't apply to the Level 1, 2, or 3. That's clearly
19 laid out within the Emergency Action Plan.

20 MR. McGEHEE: Thank you, sir.

21 No further questions. Pass the witness.

22 THE COURT: Okay. Anything further?

23 MS. DUNCAN: I just have a couple of redirect
24 questions, Your Honor.

25 THE COURT: Okay. Recross.

1 MS. DUNCAN: Recross, exactly. Excuse me.

2 RECROSS-EXAMINATION

3 BY MS. DUNCAN:

4 Q. Mr. Bardol, we were just talking about JX 1,
5 the declaration of emergency signed by Colonel
6 Zetterstrom at the time.

7 You haven't talked to Colonel Zetterstrom
8 about what this declaration means, have you?

9 A. No, I have not.

10 Q. Okay. And you don't cite his testimony in
11 your report, do you?

12 A. No, I do not.

13 MS. DUNCAN: No further questions.

14 THE COURT: Okay. Thank you.

15 And, Mr. Bardol, at this point the court
16 thanks you for your testimony and you're excused.

17 THE WITNESS: Thank you.

18 (Witness excused.)

19 MR. McGEHEE: And, Your Honor, there's a rare
20 chance that we may call Mr. Bardol in our rebuttal
21 case. So if he could remain in the courtroom, we would
22 appreciate it.

23 THE COURT: Okay. Mr. Bardol.

24 THE WITNESS: Thank you, sir.

25 THE COURT: Who is -- what do we do next?

1 MR. MITHOFF: Your Honor, at this time we
2 call Mr. Thomas.

3 THE COURT: Okay. Mr. Thomas, if you'll come
4 forward.
5 Thereupon--

6 ROBERT CHARLES THOMAS, III
7 was called as a witness and, after having been first
8 duly sworn, testified as follows:

9 THE COURT: Thank you very much.
10 The witness has been sworn in and it ready to
11 proceed.

12 MR. MITHOFF: Thank you, Your Honor.

13 DIRECT EXAMINATION

14 BY MR. MITHOFF:

15 Q. Would you state your full name, please, sir.

16 A. Robert Charles Thomas, III.

17 Q. And what is your profession or occupation?

18 A. I'm a professional engineer.

19 Q. And you are employed by who?

20 A. The U.S. Army Corps of Engineers, Galveston
21 District.

22 Q. And for how many years have you worked for
23 the corps?

24 A. Around 20.

25 Q. Tell us about your education generally,

1 please, leading up to your work with the corps.

2 A. I have a bachelor's degree in maritime
3 systems engineering from Texas A&M University in
4 Galveston, and I have a master's degree in ocean
5 engineering from Texas A&M University.

6 Q. And you have been designated as I understand
7 it to represent the corps in this case as the
8 representative of that party?

9 A. Do you mean to watch the case, sir?

10 Q. To observe the case and appear as a witness
11 on behalf of the corps?

12 MS. DUNCAN: Objection, Your Honor.

13 Mr. Thomas is testifying in his personal capacity, not
14 as a designated like 30(b)(6) representative, for
15 example. That wouldn't even be a thing.

16 THE COURT: So he's not the representative of
17 the corps?

18 MS. DUNCAN: He is a party representative for
19 purposes of trial to sit with us and serve as a face of
20 the corps, but his comments here, for example, do not
21 bind the corps. He works for the corps.

22 THE COURT: Right. I guess no witness binds
23 the corps. The only official statements of the corps
24 looking at their authority would probably be the chief
25 of staff of the corps or the commander of the corps, so

1 in terms of that, I understand his words don't have
2 legal power that can make a contract.

3 MR. MITHOFF: He has been designated, Your
4 Honor, in both cases as a 30(b)(6) witness and he is
5 the witness identified with the adverse party here.

6 THE COURT: Right.

7 MR. MITHOFF: We request to call him under
8 Rule 611.

9 THE COURT: Right. That's appropriate. But
10 representative legally of the corps means you have
11 power to bind the corps to contracts. That's all the
12 significance is here. Any member of the corps speaking
13 is speaking on their own, presumably, or maybe they're
14 speaking for the corps. We don't really know. The
15 corps concentrates at least in the contract authority
16 everyone in certain specific categories.

17 BY MR. MITHOFF:

18 Q. And you have been permitted to sit through
19 the trial so far, have you not, sir?

20 A. Yes, sir.

21 Q. Let me talk to you first about obligations of
22 reporting.

23 With respect to Reporting of Evidence of
24 Distress of Civil Works Structures, you're familiar
25 generally with this document?

1 A. So this is an engineering regulation. I
2 think it may have been superseded.

3 Q. This is dated March the 15th of 1996 and was
4 produced in response to a request for production in
5 this case.

6 Do you recognize it as being substantially
7 similar to the one in existence at the present time?

8 A. I'd have to go compare them, sir.

9 Q. It is referenced in documents provided along
10 with the Emergency Action Plan in this case, I will
11 walk through the provisions with you and if you think
12 current provisions are different, you can tell me. Is
13 that fair?

14 A. Yes, sir.

15 MS. DUNCAN: Objection, Your Honor, as to the
16 relevance of this. I believe the witness testified
17 that it was superseded.

18 THE COURT: He testified he thought it might
19 be superseded, but I don't think he testified it
20 definitely was superseded. So he can certainly use a
21 superseded document at least for some purposes, so I'll
22 allow it.

23 MR. MITHOFF: Let me --

24 MS. DUNCAN: Your Honor, it hasn't been
25 established that this document was in effect at the

1 time of Harvey or another relevant time period.

2 THE COURT: Well, we'll let the witness see
3 if he can establish that.

4 BY MR. MITHOFF:

5 Q. You have seen a document such as this before,
6 have you not?

7 A. Would it be possible to have a copy I could
8 read, sir? My vision is a mess.

9 Q. Do you want me to move it closer or...

10 A. If you have one, that would be way better.
11 Yes, sir. I can use my glasses.

12 Thank you.

13 Q. It is entitled "Engineering and Design
14 Reporting of Evidence of Distress of Civil Works
15 Structures."

16 You're generally familiar with this area, are
17 you not?

18 A. I'm familiar with the topic, yes, sir.

19 Q. What was your role specifically at the time
20 of these events in question?

21 A. I was the Galveston district's engineering
22 and construction division chief and the district's dam
23 safety officer.

24 Q. Were you the highest or one of the
25 highest-ranking officers on duty at that time?

1 A. Within the Galveston district?

2 Q. Yes, sir.

3 A. Yes, sir.

4 Q. Is that true?

5 A. Yes, sir.

6 Q. And you were acting in that capacity at the
7 time of these events; is that accurate?

8 A. Yes, sir.

9 Q. You have written a letter describing your
10 findings along with a detailed report, have you not, in
11 connection with what occurred here?

12 A. Which letter, sir?

13 Q. We're going to cover your letter. But you
14 wrote a report of performance, did you not?

15 A. We did write a report of performance.

16 Q. You wrote a cover letter to that report of
17 performance, did you not?

18 A. I did.

19 Q. Have you had a chance to review those
20 documents?

21 A. Yes, sir.

22 Q. And did you understand that those documents
23 were being written pursuant to generally the
24 obligations imposed upon you with respect to reporting
25 of the stress of civil works structures?

1 A. I think that report was written specifically
2 based on a requirement in engineering regulation
3 1110-2-1156, I think.

4 Q. Well, let me ask you about the purpose as
5 stated in the document we have in front of us.

6 "Number one, this regulation prescribes the
7 responsibilities and procedures for the immediate
8 notification to higher authority of evidence of
9 distress or potential failure of civil works projects.
10 These procedures apply to projects under construction
11 or in operation."

12 You prepared a report. Was your report
13 intended to cover any notification of any distress or
14 potential failure?

15 A. So I think what this is talking about is how
16 we report to our division and headquarters when we
17 initially find some damage like during the actual
18 event. So, say, we find a new slide, we would then go
19 and report that to our division headquarters. I don't
20 think this is the same thing as the letter you're
21 talking about, sir.

22 Q. Did your letter have that as part of its
23 purpose?

24 A. I don't think that's the purpose of the
25 letter, sir.

1 Q. All right. We'll move to the letter and I'll
2 ask you about one more paragraph under discussion.
3 "The intent of this regulation is to keep the U.S. Army
4 Corps of Engineers chain of command informed by
5 ensuring the immediate reporting, inspection and
6 follow-up evaluation of conditions that demonstrate
7 evidence of distress or conditions that could result in
8 a potential hazard of civil works projects. Initial
9 reporting should be via telephone with a follow-up
10 written summary with appropriate photographs."

11 Did you understand your report to at least
12 follow the general requirements as set out here to
13 report any number of potential signals of distress
14 including, among others, any other indications of
15 distress or potential failure that would inhibit the
16 operation of a project or endanger life and property?

17 A. So to be clear, I think this is different
18 than the other report. But we did make these kind of
19 reports following our Emergency Action Plan to the
20 division of the headquarters to report -- let's see,
21 what does it say, the -- you know, the conditions at
22 the time, the potential hazards to our civil works
23 projects. So we absolutely were making those kinds of
24 reports to both the division and the headquarters
25 following the notification chart in the Emergency

1 Action Plan, sir.

2 Q. So you were making reports that would be
3 similar to those described?

4 A. Yes, sir. Following what you -- in the
5 discussion section.

6 Q. Let's look at the report you did write.
7 Let's look first at a document provided to us dated
8 October 27 of 2017 entitled "Memorandum for Commander,
9 Southwest Division."

10 And it is signed by you, Robert C. Thomas?

11 A. That is, sir. Could I also have a copy of
12 this? My vision, it's really hard to read from there.

13 Q. I'm sorry.

14 A. I apologize.

15 Q. I can move it a little closer if it would
16 help.

17 A. You would have to move it a lot closer and
18 then nobody else could see it. I do not mind reading
19 it, sir. My vision has just gone terrible.

20 Thank you, sir.

21 Q. Can you read your copy?

22 A. Oh, yes, sir. Thank you.

23 Q. You're shown here as chief engineering and
24 construction division, Galveston district dam and
25 levee. That's you?

1 A. Yes, sir.

2 Q. And it's entitled "Report of Performance."
3 What is the purpose of this report?

4 A. So the enclosure is report of performance,
5 and every time we reach a new first filling in a
6 reservoir, we're required to go in and report the
7 structural performance of the structure, and so that's
8 what this is. This is a report of the structural
9 performance after that new pool of record.

10 Q. So as you say in the first paragraph, that
11 "The Addicks and Barker Dams both set a new pool of
12 record," as you mentioned, "this was due to Hurricane
13 Harvey stalling over the Addicks and Barker Reservoir
14 watershed producing 32 to 35 inches of rain from 25 to
15 29 August, 2017."

16 So this is written approximately two months
17 after the event, correct, almost two months?

18 A. Correct.

19 Q. You've had time to review your notes and to
20 consolidate your thoughts about the event?

21 A. Well, most importantly it gave us time to go
22 out and inspect the project.

23 Q. That's fine.

24 Inspect the project, take your notes,
25 consolidate your thoughts, and prepare a report --

1 A. Correct.

2 Q. -- correct?

3 "Galveston district engineers were on-site
4 monitoring around the clock under the Stage 2 extended
5 watch alert in accordance with the Addicks and Barker
6 Dams' Emergency Action Plan. Visual observations,
7 photographic evidence, and instrumentation readings
8 were recorded. The enclosed report," which we'll get
9 to in a minute, "documents the project's performance
10 for the new pool of record in accordance with the
11 requirements of ER 1110-2-1156, Safety of Dams Policy
12 and Procedures."

13 You then go on to summarize your findings, do
14 you not, set out in more detail in the report of
15 performance, correct?

16 A. Yes, sir.

17 Q. You say "The embankment, outlet structures,
18 and emergency spillways functioned as intended."

19 True?

20 A. Correct.

21 Q. "Piezometers, settlement pins, and alignment
22 surveys for the outlet structures do not show any
23 alarming trends from this pool of record."

24 True statement?

25 A. Yes, sir.

1 Q. "There were no observations of seepage or
2 critical distress areas located on the dams."

3 True statement?

4 A. Correct.

5 Q. "Wet areas located on the downstream
6 embankment were monitored but showed no signs of flow.
7 Erosion of the dam and cofferdam crest became an issue
8 for inspection teams trying to traverse them. Overall
9 conclusion is that the project was performing as
10 expected with no significant problems during this pool
11 of record."

12 True statement?

13 A. Yes, sir.

14 Q. There is no statement in your cover letter or
15 in your report, as we'll see in a moment, indicating
16 any concern about an imminent failure of the dams, is
17 there?

18 A. There is not.

19 Q. And if there had been in your mind any
20 concern about imminent failure of the dam, you would
21 have written it in your report?

22 A. I think that had there been progression
23 towards a dam breach, there would have been damage that
24 would have been documented in this structural report,
25 that's correct.

1 Q. And specifically if there had been imminent
2 danger to the dams or imminent failure of the dams, you
3 would have written it in your report?

4 A. And let me define how we used the word
5 "imminent." And if you use it differently, we can
6 change that. When we say "imminent," we mean the dam
7 is actively failing, progressing towards failure. And
8 it's generally about to fail. That's what we mean by
9 imminent. So something -- we're seeing damage, the
10 damage is happening and we don't think we're going to
11 be able to stop it. That's what we mean by imminent.

12 Q. Well, there are actually several levels, are
13 there not, of -- essential for dam failure? And we
14 have, as you'll see in your report in more detail, an
15 explanation of those potential problems. I'll find
16 that exact language so you can have that in front of
17 you.

18 While we're looking for that let's just go to
19 the report of performance and then we'll go back
20 through. This may be it.

21 MR. MITHOFF: Thank you, sir.

22 BY MR. MITHOFF:

23 Q. This is what you were thinking about, wasn't
24 it?

25 A. Yes, sir. And if I could also have a copy, I

1 would appreciate it.

2 Q. Okay. We'll get you a copy.

3 MS. DUNCAN: Can we get an exhibit number?

4 MR. MITHOFF: JX 3. Emergency Action Plan,
5 Addicks Reservoir and Barker Reservoir.

6 THE WITNESS: Thanks again, sir.

7 BY MR. MITHOFF:

8 Q. I think this may help us talk about what you
9 were attempting to explain about your responsibility in
10 reporting, so let's walk through this section.

11 Can you do that with me?

12 A. Yes, sir.

13 Q. Have you found in the booklet where this
14 appears?

15 A. Yes, sir.

16 Q. You're acquainted with it?

17 A. Yes, sir.

18 Q. Okay. It's entitled "Addicks and Barker and
19 Emergency Action Plan to Emergency Operations Plan."

20 It begins with what's called "Stage 1
21 extended watch," correct?

22 A. Yes, sir.

23 Q. It sets out the circumstances and
24 requirements under extended watch, "Addicks Reservoir
25 pool reaches 87 feet NAVD 88 or Barker Reservoir pool

1 elevation reaches 85 feet NAVD 88. Reservoir pools
2 have reached significant levels to warrant extended
3 watch of the structures due to surrounding conditions."

4 "Stage 2 extended watch. Addicks Reservoir
5 pool elevation reaches, or is predicted to reach
6 97.5 feet NAVD 88, or Barker Reservoir pool elevation
7 reaches, or is predicted to reach 93.6 feet NAVD 88."

8 Let's pause there and talk about your report
9 that accompanied that cover letter. And we'll come
10 back to this progression.

11 Do you need a few more minutes to look?

12 A. Not yet, sir.

13 Q. This is your report of performance, correct?

14 A. Yes, sir.

15 Q. Dated around the same time, I believe, as
16 your cover letter. I don't have the date here in front
17 of me.

18 A. This is October 13th, sir, which is around
19 the same time as the cover letter.

20 Q. You described the events in the first
21 paragraph which we have generally described already.
22 And in the second paragraph, you say "In accordance
23 with the Emergency Action Plan for Addicks and Barker
24 Dams, Stage 2 extended watch alert was activated on
25 August 27, 2017, when the reservoirs' pool levels

1 exceeded elevation 97.5 feet and elevation 93.6 feet,
2 respectively."

3 Correct?

4 A. Correct.

5 Q. True statement?

6 A. Yes, sir.

7 Q. Okay. So is the Stage 2 extended watch that
8 you're referring to there the Stage 2 extended watch
9 that we see here on Exhibit 3, the document that we
10 just looked at?

11 A. It is.

12 Q. Did you ever in your report, your final
13 report, conclude that the emergency action level went
14 beyond Stage 2, that is did you ever report in your
15 report an Emergency Level 1 or an Emergency Level 2 or
16 an Emergency Level 3?

17 A. That is not in the report.

18 Q. And if you had concluded that these events
19 reached Emergency Level 1, unusual event or developing
20 condition, you would have said so?

21 A. Not necessarily.

22 Q. Well, if you were being forthright, would you
23 not have said that it reached the Emergency Level 1 if
24 you believed it?

25 A. I think you asked me this question during the

1 deposition as well, and I think what I said there was
2 not super clear. I think I said because there wasn't
3 an imminent breach scenario, right. And what I'm
4 talking about is there's two kinds of emergencies in
5 the Emergency Action Plan. One is a breach emergency
6 and one is a non-breach emergency. And they're both
7 covered by the AP, but in this case this report is
8 about structural performance of the dams and so because
9 like you said, at the end, we decided that the dams
10 actually performed very well. You know, that wasn't
11 something that went into this report.

12 Q. Well, you concluded that the dams performed
13 very well, did you not?

14 A. We did. Structurally.

15 Q. All right.

16 A. That's not to say that flooding is okay.

17 Q. Flooding under these circumstances is not
18 okay, but we'll continue with that.

19 My point simply is, sir, I mean you take an
20 oath as a part of what you do in this work, do you not?

21 A. Yes, sir.

22 Q. And you're bound by that reporting document
23 we talked about whether there's a separate version of
24 that or not, you're bound by that to not only report
25 orally but to follow up with a written report?

1 A. Well, like we said, this report is not the
2 same as what you showed me earlier, sir.

3 Q. It's similar to the final report that we had
4 talked about earlier. It was your final report in this
5 case, was it not?

6 A. Well, we disagree about that, sir.

7 Q. Okay. Was this your final report in this
8 case?

9 A. This is the final report of performance for
10 the pool of record. That's what this is, sir.

11 Q. All right. Did you write any other reports
12 about this event?

13 A. I think so.

14 Q. I'm sorry?

15 A. Yes, sir. There's other reports, I think.

16 Q. Did you write other reports about your
17 conclusions about what occurred here?

18 A. So there's a summary from the Risk Management
19 Center that helped us during the dam safety emergency.
20 They've got that. We've certainly documented quite a
21 bit as part of the Buffalo Bayou and Tributary Study.
22 So there are other reports that talk about the flooding
23 during Hurricane Harvey.

24 Q. Did you ever write a report which you
25 concluded that there existed an Emergency Level 1?

1 A. I don't know that there is a report that says
2 there was Emergency Level 1 outside of my depositions,
3 of course. But clearly you can read the Emergency
4 Action Plan and you can see that Emergency Level 2
5 conditions for non-breach scenario were met.

6 Q. I'm sorry? Were met?

7 A. They were met, sir. Just like it said in the
8 deposition earlier.

9 Q. Well, we'll talk about your deposition in a
10 minute. You actually said in your deposition that you
11 are not aware that an Emergency Level 1 had ever
12 occurred or an Emergency Level 2 had ever occurred or
13 an Emergency Level 3 had ever occurred. You said, "I
14 don't believe so."

15 Do you remember that?

16 MS. DUNCAN: Objection. Misstates the
17 question.

18 THE COURT: What?

19 MS. DUNCAN: He's reading from -- it
20 misstates the question posed in the deposition. He's
21 misstating deposition testimony.

22 THE COURT: Well, I thought that -- let's
23 read the deposition testimony and see if he can...

24 BY MR. MITHOFF:

25 Q. I think I handed you a copy, did I not?

1 A. I don't think I have the deposition, sir, no.

2 Q. Did you say during the deposition --

3 MS. DUNCAN: Can I get a -- there were three
4 depositions. Can I understand the date and the page
5 and the line?

6 MR. MITHOFF: Excuse me. I'm about to say.

7 MS. DUNCAN: Well, before he reads it, I'd
8 like to be able to find it so I can follow along.

9 THE COURT: Okay. What is the deposition
10 date?

11 MR. MITHOFF: It's Volume II, August 3, 2018.

12 THE COURT: Okay. Wait a moment.

13 MR. MITHOFF: Page 275.

14 THE COURT: Okay. You may proceed.

15 MR. MITHOFF: May I approach the witness so
16 he can have a copy?

17 THE COURT: Yes.

18 BY MR. MITHOFF:

19 Q. Do you recall -- I think I was there.

20 A. Thank you, again, sir.

21 Q. Do you recall?

22 A. Yes, sir, I remember.

23 Q. Okay. You remember me?

24 A. I remember you.

25 Q. Okay.

1 A. Not all the questions.

2 Q. Okay. I asked you, sir --

3 A. I can't see it. I'm old, sir. What do I do?

4 Q. I'm older than you are.

5 A. I know it.

6 Q. "Has there ever been a formal declaration of
7 a Level 2 emergency in the history of the Addicks and
8 Barker Dams and Reservoirs?

9 "Answer: Not that I know of, sir."

10 Correct?

11 A. Right. And the reason it says that is
12 because you asked a very specific question about a
13 formal declaration, and in this case for this
14 non-breach emergency, we had already declared an
15 emergency and so there wasn't some additional
16 declaration made.

17 Q. I'm going to allow you to explain in a
18 moment. I simply want an answer first to my question.

19 When I ask you has there ever been a formal
20 declaration of a Level 2 emergency in the history of
21 the Addicks and Barker Dams and Reservoirs, you said,
22 "Not that I know of, sir."

23 Was that what you said?

24 A. Yes, sir.

25 Q. I asked you:

1 "Has there ever been a formal declaration of
2 a Level 1 emergency?"

3 And you answered:

4 "Not that I know of, sir."

5 Is that correct?

6 A. Yes, sir.

7 Q. And I asked you:

8 "Has there ever been a formal declaration of
9 a Level 3 emergency?"

10 And you said:

11 "Not that I know of, sir."

12 A. Correct.

13 Q. You've given several depositions in this
14 matter, have you not?

15 A. Yes, sir.

16 Q. You testified at trial, have you not?

17 A. I have.

18 Q. Has it ever been explained to you that if you
19 read your deposition and see a mistake or a
20 misstatement, you have the right to change it, alter
21 it, correct it?

22 A. It has been.

23 Q. And did you correct this testimony?

24 A. I did not.

25 Q. If there had been concern, sir, about a

1 potential for dam failure or conditions that would
2 deteriorate and eventually lead to dam failure or an
3 extremely urgent situation where conditions are such
4 that failure of either Addicks Dam or Barker Dam is
5 judged to be imminent or in progress, you would have
6 reported it, would you not?

7 A. Absolutely.

8 Q. And you did not do so, did you?

9 A. So that's not true.

10 Q. Did you ever, sir, in any of these reports,
11 and we'll look at your entire report in a moment, did
12 you ever at any time in your report of performance
13 mention the words "imminent failure of a dam"?

14 A. No, sir.

15 Q. Did you ever at any time in your report of
16 performance designate this an emergency 1, 2, or 3?

17 A. Not in the report of performance.

18 Q. Have you amended this report somehow and
19 we're not aware of it?

20 A. No, sir.

21 Q. Did you change anything in the report?

22 A. No, sir.

23 Q. Is it a true report? Can we rely on it?

24 A. Yes, sir.

25 Q. Is it accurate?

1 A. Yes, sir.

2 Q. In fact, you go on to say after designating a
3 Stage 2 extended watch -- are you with me? Can you
4 see?

5 A. Yes, sir. Thank you.

6 Q. You go on to say at the last part of that
7 second paragraph, "In general, both dams functioned as
8 expected throughout the flooding event, and no critical
9 issues were observed that would impact the future
10 performance of the dams."

11 Is that true?

12 A. Yes, sir.

13 Q. And then you go on to talk about Stage 2
14 observation teams.

15 Do you have that in front of you?

16 A. Yes, sir.

17 Q. Does Stage 2 refer to the same Stage 2 that
18 we were talking about here?

19 A. Yes, sir.

20 Q. So your Stage 2 observations say "In general,
21 the observation teams did not find any critical issues
22 that could impact the proper performance of the dams.
23 The observers were primarily composed of civil,
24 structural, geotechnical, and hydrology and hydraulic
25 engineers. Technicians having previous dam safety

1 training were also selected to help fill the gaps in
2 the observation teams. Observers were trained in
3 identifying any potential defects or damages, such as
4 sand boils, surface erosions, slides, seepages, and
5 depressions, et cetera, which might occur during a high
6 reservoir pool event."

7 What is a sand boil?

8 A. It's where water is coming out of an
9 embankment and it's carrying sand with it so you see
10 sand kind of piling up.

11 Q. You didn't see that?

12 A. No, sir.

13 Q. And surface erosions are what?

14 A. So you saw that in the first page. There was
15 some surface erosion on the cofferdam, but it's just
16 water flowing over the embankment, taking some of the
17 sediment with it.

18 Q. Not anything serious?

19 A. Not anything that would lead to imminent dam
20 failure.

21 Q. And slides, what do you mean by "slides"?

22 A. So that's where a part of the embankment,
23 some of the soil actually slides down the face of the
24 embankment.

25 Q. And you didn't see that?

1 A. No, sir.

2 Q. Seepages, what is that?

3 A. That's where you've got water moving through
4 the embankment.

5 Q. Depressions, what is that?

6 A. It's just what you might think it is. When
7 you're looking at the embankment, it's just the soil
8 has moved down as if someone has removed something from
9 underneath it.

10 Q. And you go on to describe 12-hour shifts of
11 four teams and two-person observers.

12 Were they working under your supervision?

13 A. They were.

14 Q. And they reported to you?

15 A. Through the dam safety program manager and
16 our mission manager, yes, sir.

17 Q. Ultimately to you?

18 A. Ultimately, yes, sir.

19 Q. And you go on to say under the heading of Dam
20 Embankment Performance there were no critical findings
21 observed during this Stage 2 Extended Watch for both
22 Addicks and Barker dams, true?

23 A. True.

24 Q. The following are some of the noncritical
25 findings that were observed and continuously monitored

1 during the Stage 2 Extended Watch. And then you
2 describe what you say are noncritical findings with
3 Addicks and with Barker. None of those caused you any
4 concern, I assume, in terms of the integrity of the
5 dams?

6 A. Right. At the end of this report -- at the
7 end of the event, we felt like the structures had
8 performed appropriately in terms of structure.

9 Q. Now, one final page, and I didn't attempt to
10 cut all of it, but I think you have the entire report.
11 If there's any that I have omitted that you think it
12 critical, you can let me know. Do you need to see this
13 or...

14 A. What page is it, sir?

15 Q. It's entitled Emergency Spillway Performance.

16 A. Oh, 7. There we go. I can see the 7.

17 Q. Have you found it?

18 A. Got it.

19 Q. The north end emergency spillway of the
20 Barker Dam was flanked by a shallow depth low-velocity
21 sheet flow from the reservoir pool. This uncontrolled
22 release is illustrated in figure 6 which is this
23 picture here, correct?

24 A. Correct.

25 Q. The full capacity of the emergency spillway

1 was not reached with only the end scour pad going under
2 water.

3 What's a scour pad?

4 A. Under the water you can see there is also
5 concrete, and that's what that is referring to.

6 Q. This was referred to in the opening of the
7 trial as a puddle. But however it's described, it's
8 not very much water there, is it?

9 A. Well, the problem with this picture is it
10 only shows you between the end of the dam and that
11 building. There's also water flowing on the other side
12 of that building. That's the problem with the puddle.

13 Q. On the other side of that building?

14 A. Yes, sir.

15 Q. No one took a picture of that?

16 A. There's pictures of it, sir.

17 Q. But not in this report?

18 A. I don't think there's a picture in this
19 report because this report is focused on this structure
20 itself.

21 Q. Okay. In any event, your conclusion was that
22 no issues were observed with the emergency spillway
23 during this event, true?

24 A. Correct.

25 Q. The emergency spillways at the south end of

1 the Addicks Dam and both at Barker Dam did not see any
2 flows.

3 I want to ask you about the emergency
4 declaration that was raised briefly. Counsel for the
5 corps has pointed to a demonstrative exhibit showing on
6 August the 22nd declaration of emergency.

7 Do you recall when the gates were opened?

8 A. I think it was the morning of the 28th.

9 Q. Midnight or morning of the 28th.

10 A. Correct.

11 Q. So six days before, counsel says there was a
12 declaration of emergency. And what we've learned,
13 obviously, I think earlier when Mr. McGehee was
14 concluding his examination is that this declaration of
15 emergency dated August 22 has to do with manning the
16 operation, the emergency operations center will be
17 manned daily from 700 to 1930, and messages can be
18 received on a 24-hour basis.

19 So the first section has to do with the hours
20 of operation, correct?

21 A. I mean, that's what it says there.

22 Q. And then the next has to do with expenses.
23 For example, EOC operations. What is EOC?

24 A. That's our Emergency Operations Center.

25 Q. Issuance or transportation of sandbags,

1 forecasting, flood engineers, or flood reconnaissance,
2 correct?

3 A. That's what it says.

4 Q. The next section has to do with paying
5 overtime for labor?

6 A. That's what it says.

7 Q. And it describes all personnel regardless of
8 grade engaged in the operations may be paid overtime,
9 correct?

10 A. Correct.

11 Q. And the earnings of the employees exempt from
12 the Fair Labor Standards Act, presumably pursuant to
13 certain provisions that allows them to be exempt under
14 certain circumstances. But none of this has to do with
15 any of the levels of emergency that we talked about
16 earlier when we were exploring the emergency levels,
17 does it?

18 A. That's not true at all.

19 Q. You mean there's a conclusion here about the
20 integrity of the dams? Doesn't this just discuss --
21 and I'm not minimizing it, but doesn't this just
22 discuss the hours of operation, the expenses, the
23 overtime? I mean, those are important, but that's not
24 an emergency such as we've seen on one, two, or three,
25 is it?

1 A. That's not what this means. What this means,
2 this is standing up our emergency management
3 organization, right? So it's implementing our crisis
4 management team. It's implementing our crisis action
5 team which immediately roll into the implementation of
6 the Emergency Action Plan at Addicks and Barker, which
7 we did. And you can see all the things that we did
8 there.

9 Q. And I think all these things are proper and
10 appropriate. I'm not suggesting that --

11 A. Yes, sir.

12 Q. -- they're not.

13 All I'm suggesting is this declaration of
14 emergency is not the same as a declaration of a Level 3
15 emergency, is it?

16 A. So Level 3 is very specific to dam failure.
17 Level 2 also has non-breach emergencies. And this is
18 how we manage non-breach emergencies. And so we had
19 the same issue in August of 2016, it went around the
20 same way, and this is how we manage non-breach
21 emergencies. So this document is correct, I think, and
22 it does declare our emergency.

23 Q. I'm not suggesting that any of these items
24 were inappropriate, sir. All I'm suggesting is that
25 six days before the gates are opened, perhaps even

1 before landfall or near landfall, this is a different
2 type of declaration. This has nothing to do with the
3 kind of emergencies that are being discussed in
4 level 1, 2, and 3? I mean, this doesn't anywhere
5 discuss Emergency Level 1, 2, or 3, does it?

6 A. It doesn't say that here, but I'm disagreeing
7 with you. I think this is our emergency declaration
8 which stood up our crisis management team and our
9 crisis -- which roles into the implementation of this
10 Emergency Action Plan especially for a non-breach
11 emergency, which is what we had during Hurricane
12 Harvey.

13 Q. Okay.

14 THE COURT: By "emergency," let me get this
15 straight in the court's viewpoint. This emergency
16 declaration was the hurricane emergency and anything
17 that was needed for that hurricane then, there was not
18 an emergency footing where normally you couldn't get
19 those things done. However, they don't relate to an
20 emergency that the dam will collapse; is that correct?

21 THE WITNESS: Correct.

22 THE COURT: There's no emergency there.

23 THE WITNESS: This isn't a breach emergency.
24 Had there been an imminent breach kind of thing, you
25 would have seen some different kind of language. But

1 for a non-breach emergency, this is exactly how we
2 manage it, sir.

3 THE COURT: Okay.

4 THE WITNESS: And that is covered in the AP,
5 sir, I just want to be super clear about that.

6 THE COURT: This is just the basic hurricane
7 emergency?

8 THE WITNESS: This is how we initiate our
9 emergency management organization for the district and
10 this is how we stand up all of our people. This is the
11 requirement for the government to start managing
12 emergencies. This is a super-important document.

13 BY MR. MITHOFF:

14 Q. I don't think anyone is quarreling equaling
15 with the importance of managing the hours and the pay
16 and duties and assembling the people. The point I
17 think that we're simply trying to make is this is not a
18 declaration of dam failure?

19 A. That is true. That does not say the dam is
20 going to fail. And that's why I've been so careful to
21 talk about this non-breach and this breach emergency.
22 So that's the difference that you see here. I can
23 understand the confusion. But there was, in fact, a
24 non-breach emergency at Addicks and Barker.

25 Q. There was what?

1 A. A non-breach emergency. People were
2 flooding. That's clearly documented in the Emergency
3 Action Plan.

4 THE COURT: So if you have a hurricane that
5 was not going to hit anywhere near Houston but was
6 hitting Galveston offshore, you would still have an
7 emergency declaration for that even though it would
8 have no relevance for what was happening at Addicks?

9 THE WITNESS: Correct. We would just not
10 stand up as many pieces, sir. We would still have our
11 forecasters working. So some pieces of the Addicks and
12 Barker emergency team would probably be working just to
13 keep an eye on it and make sure it remained safe. And
14 then as the emergency evolves, you know, we just evolve
15 with it.

16 THE COURT: Yeah.

17 BY MR. MITHOFF:

18 Q. And that makes sense because you don't know
19 at this point whether you're facing a Level 1, 2, or 3,
20 do you?

21 A. We're learning that on the next day,
22 unfortunately. Right as it's happening.

23 Q. Well, day by day you're learning?

24 A. Right. And even on the 23rd we had realized
25 we're starting to hit the triggers for the Emergency

1 Level 2.

2 Q. Where does it say in your report that you're
3 hitting the triggers for Emergency Level 2?

4 A. Are we talking about the foundation or the
5 structural integrity report, sir?

6 Q. Yeah.

7 A. It doesn't say that at all, sir.

8 Q. Okay. I didn't think it did.

9 THE COURT: What's a good time for a break?
10 How long do you anticipate this witness?

11 MR. MITHOFF: Perhaps, Your Honor, another --
12 perhaps another 45 minutes or an hour, so I can finish
13 up first thing in the morning.

14 THE COURT: Okay. If it's going to be that
15 long, we might as well take our evening break now and
16 come back tomorrow and finish up.

17 Are you anticipating an hour more?

18 MR. MITHOFF: Or less.

19 THE COURT: Okay. What does the government
20 anticipate for cross?

21 MS. DUNCAN: Well, as you recall, Your Honor,
22 that we are taking our witnesses at the same time.

23 THE COURT: Yes.

24 MS. DUNCAN: And so we reported in our
25 witness list that we anticipated Mr. Thomas was going

1 to take approximately five hours or so. He was, you
2 know, as you can hear, present at the event and part of
3 the decision-making team. So his testimony is very
4 relevant.

5 THE COURT: Okay. Well, why don't we then
6 try to get all that done tomorrow.

7 Anything else we can need to do before we
8 adjourn for the night?

9 THE WITNESS: I don't believe so, Your Honor.

10 THE COURT: Okay. Government, there is
11 nothing?

12 Okay. We will stand in recess until tomorrow
13 morning at 10:00.

14 (Proceedings recessed at 4:49 p.m.)

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1 C E R T I F I C A T E

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5 I, Gary Schneider, a shorthand reporter, do hereby
6 certify that the foregoing proceedings were taken down
7 and transcribed under my direction to the best of my
8 ability.

9

10 DATED: November 12, 2024 s/Gary Schneider
11 Gary Schneider, RMR, CRR

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1	ADMITTED EXHIBITS		
2			
3	PX	PAGE	DESCRIPTION
4	47	389	8/3/2018 Deposition of Robert
5			Thomas 30(b)(6), Vol II
6			
7	DDX	PAGE	DESCRIPTION
8	1	224	Slides
9			
10	DX	PAGE	DESCRIPTION
11	105	388	4/1/1962 Water Control Manual
12			(1962)
13	114	389	10/18/2023 Addicks and Barker
14			Emergency Action Plan (2023)
15	213	388	CWMS Forecast and Transmittals,
16			8/23/17 to 9/15/17
17	372	389	8/27/2017 Email from Michael
18			Kauffman to Coraggio Maglio with
19			subject "RE: Addicks and Barker
20			Dam Releases"
21	637	389	Maps and Photos of Addicks and
22			Barker Dams Gated Outlet Structures
23			and Emergency Spillways
24			
25			

1	JX	PAGE	DESCRIPTION
2	1	389	8/22/2017 "Declaration of Emergency:
3			August 2017 Tropical Event Harvey,
4			Galveston District"
5	13	389	3/31/2014 ER 1110?2?1156: Safety of
6			Dams - Policy and Procedures
7	42	389	5/1/2013 "DSMR - U.S. Army Corps of
8			Engineers, Addicks and Barker Dam
9			Modification Report (May 2013)"
10	54	388	3/1/2018 "Hurricane Harvey Flood
11			Inundation Mapping After Action
12			Report - InFirm (2018)"
13	171	388	"Profile Plot Figure B?11: Modeled
14			Peak Water Surface Elevation Profile
15			with HWMs"
16	175	389	Harvey Downstream model comparison
17			
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